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Evidence-Based AI Training for Educators: Competency Development in the ZAMBASULTA Region

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Abstract. This study investigated the impact of Department of Information and Communications Technology (DICT) CPD-accredited capacity-building programs on Artificial Intelligence (AI) in Region IX and BASULTA to develop evidence-based courses and digital competency advancement. As we navigate the complexities of the "age of intelligence" following the 2022 generative AI surge, this research explored participant proficiency across five specialized modules, while simultaneously documenting baseline implementation challenges and infrastructural friction. Utilizing a descriptive-quantitative research design, the study employed purposive sampling to evaluate training participants through the DICT Standardized Training Evaluation Tool. Key findings from empirical data gathered between March and May 2026 indicate exceptionally high proficiency levels among participants. Mean evaluation ratings consistently ranged between 4.0 and 5.0, specifically within the critical dimensions of Mastery of Subject Matter and Instructional Methodology. Furthermore, analysis indicated that the structured training successfully bridged demographic gaps. While demographic groupings showed no statistically significant variance in ultimate proficiency, systemic external challenges, most notably intermittent internet connectivity and course pacing, were identified as primary friction points affecting the learning experience. The study concludes that the CPD-accredited AI program effectively massified foundational AI literacy in historically underserved regions. The research recommends the institutionalization of a "Competency-Based Technology Skills Enhancement Workshop." This proposed framework focuses heavily on subject-specific AI applications and the integration of offline-compatible digital tools, thereby ensuring a resilient and sustainable pedagogical transformation in the current post-digital era.

Keywords: AI Literacy; Capacity-Building, Continuing Professional Development (CPD); Digital Transformation; Educational Technology; Prompt Engineering; ZAMBASULTA

Introduction

In the 21st century, digital literacy became a foundational necessity rather than an optional skill. It allows both educators and learners to find and evaluate credible information amid an overwhelming amount of online data while helping them adapt quickly to new tech tools like Artificial Intelligence and collaboration platforms. This literacy expands beyond technical skills. It grants access to diverse cultures and practices through digital mediums, enabling teachers and students to creatively produce and communicate ideas across various formats. Today, this technological landscape is undergoing a massive digital revolution that supersedes basic telecommunications. Since the emergence of high-capability generative AI (GenAI) in late 2022, the world has rapidly entered an age of intelligence. This development requires a major reconfiguration of traditional teaching and learning techniques toward human-centered AI (HCAI) approaches that prioritize human capital by amplifying cognitive skills, ensuring ethical governance and meaningful human control over automated decisions. This is aligned with the United Nations Educational, Scientific and Cultural Organization (UNESCO) Recommendation on the Ethics of Artificial Intelligence (2021) and the UNESCO AI Competency Framework for Teachers (2024) which promotes the responsible use of AI in education by strengthening educators' AI literacy, ethical decision-making, and effective teaching practices. Similarly, the Philippine government's National AI Strategy Roadmap (2021) also recognizes education and workforce upskilling as essential to building an AI-ready society. Therefore, academics, policymakers, and higher education institutions strongly advocate for integrating AI Literacy directly into the modern educational curriculum (Purnama et al., 2021).

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Despite the recognized value of digital literacy, there are still undeniable and often unfair inequalities in technology access, frequently resulting in academic disadvantages for learners in marginalized areas. For example, secondary students in rural regions of developing nations like India, Philippines, and Nigeria often lack adequate digital resources, driving distinct academic disparities (Olatunji, 2017). A similar barrier is observed in indigenous communities within remote regions of Australia and Canada, where systemic technological inequality severely restricts meaningful access to technology such as digital learning platforms (OECD, 2019). These widespread gaps highlight the urgency of understanding exactly how localized technological skills and infrastructure constraints intersect with learners' success.

To bridge these gaps, governments and global organizations champion educational technology to promote global competitiveness, workforce resilience, and United Nations Sustainable Development Goal (SDG), which emphasizes global citizenship and sustainable development. In the Philippines, public agencies have long sought to navigate this revolution. The Department of Education (DepEd) initiated early ICT programs such as the Computerization Program to enhance educational services. While the Department of Information and Communications Technology (DICT), which was established through the Republic Act No. 10844, 2015, mandates a focus on fostering digital maturity and reskilling the future workforce.

However, despite overall progress, a major gap still exists within education. While big cities can quickly adopt advanced tools like AI, rural and remote areas, such as parts of the Zamboanga Peninsula and the nearby BASULTA islands, still face systemic challenges such as access to basic IT infrastructure, stable electricity, and reliable connectivity. Furthermore, the lack of a unified national standard for educational technology leaves individual schools to navigate the rapid and fast-paced technological changes entirely on their own, severely worsening the gap. This creates an unequal system where learners' digital skills depend entirely on where they go to school, while forcing overwhelmed teachers to figure out complex technologies without a clear roadmap or support system.

Research Questions

This investigation is structured to resolve the following formal inquiries:

1. What is the level of participant proficiency across Modules 1-5 of the AI capacity-building program?
2. What are the specific challenges encountered during the training sessions?
3. What is the baseline academic and proficiency metric of the participants relative to digital maturity?
4. Is there a significant difference in proficiency levels when participants are grouped according to their demographic profiles?
5. Based on the results, what pedagogical innovation or course development framework can be proposed to enhance digital skills?

Scope and Delimitation of the Study

This study assessed the AI competencies and training outcomes of educator-participants under the Continuing Professional Development (CPD)-accredited AI capacity-building programs in the Department of Information and Communications Technology (DICT) Region IX and BASULTA (Basilan, Sulu, and Tawi-Tawi) conducted from March to May 2026. It focused on evaluating the resource person's mastery of subject matter, instructional methodology, communication skills and classroom management. Additionally, the course curriculum and administrative arrangements were also examined. The study covered all participating public and private school educators who attended the designated training sessions across the regions, with individual respondents and their respective institutions coded for anonymity to ensure strict confidentiality.

Literature Review

The Surge of Generative AI in Professional Education (2022–Present)

Tan, Cheng, and Ling (2025) observe that since late 2022, the rapid maturation of generative artificial intelligence (genAI), characterized by large language models (LLMs) such as ChatGPT and Gemini, has catalyzed a significant "publication boom" and a surge in scholarly attention toward AI's role in teaching. This period has transitioned AI from a tool for narrow administrative support to a central disruptive force capable of content creation, creative writing, programming, and complex data analysis. Hlede et al. (2024) further argue that this evolution makes AI literacy an essential requirement for educators to remain relevant in a "post-digital" society where AI is increasingly embedded in clinical and educational workflows. Ensign, Nisly, and Pardo (2024) highlight that while generative AI presents unprecedented possibilities for continuing professional development (CPD), it demands a balanced approach that maximizes technological potential while rigorously addressing ethical and privacy concerns.

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Conceptualizing AI Literacy: Operational, Sociocultural, and Critical Dimensions

Atias and Mawasi (2025) propose that AI literacy is no longer a single and indivisible but a multidimensional construct comprising operational, sociocultural, and critical dimensions. Operational AI literacy involves foundational knowledge of AI mechanisms and the functional capacity to navigate a domain using AI algorithms. This simply means it focuses on the hands-on skills needed to understand and run AI tools to solve specific problems. On the other hand, Sociocultural AI literacy is the awareness of how these automated systems change human communication, workplace relationships, and society as a whole. Atias and Mawasi (2025) emphasize that critical AI literacy is the least developed dimension. Yet, this competency is essential in enabling educators to critically examine the social, ethical, and historical power structures embedded within AI systems and to recognize, challenge, and mitigate systemic algorithmic biases. This multidimensional perspective is supported by Ng et al. (2021), who identify these key themes across evolving AI education frameworks.

The ALEERRT-CA Theoretical Framework for AI-Enhanced CPD

To evaluate modern capacity-building, Hlede et al. (2024) developed the ALEERRT-CA framework, which identifies six critical pillars: AI Literacy, Explainability, Ethics, Readiness, Reliability, and Learning Theories. This framework recognizes that successful AI training extends beyond teaching technical skills and requires a holistic approach that prepares learners to understand, evaluate, and apply AI technologies responsibly. Additionally, this model positions AI-enhanced CPD as a complex sociotechnical system situated within Complexity Theory (CT) and Actor-Network Theory (ANT). According to Hlede et al. (2024), the CT lens observes macro-level system behaviors like feedback loops, while the ANT lens explains how localized interactions between humans and non-human actors (like chatbots) co-produce digital transformation. This framework enables organizations to move beyond operational guidance to understand why AI reshapes professional roles and routines.

Prompt Engineering and the PTCF Framework for Instructional Optimization

Tan, Cheng, and Ling (2025) identify conversational AI as the most frequently utilized technology in teacher professional development, making "Prompt Engineering" a vital competency for educators. Numerous prompt engineering frameworks have been developed to improve the effectiveness of interactions with genAI systems. Among the most widely used is the PTCF Framework, which acts as a guide in crafting structured and effective prompts by clearly defining the Persona, Task, Context, and Format of the desired output. Moreover, the PTCF framework provides a structured methodology for educators to craft precise prompts, moving from basic search queries to generating professional-grade lesson plans and study guides. Nathaniel et al. (2025) suggest that meaningful prompting allows learners to abstract elements and decompose complex problems, which motivates them to become active participants rather than passive users. Tan, Cheng, and Ling (2025) note that mastering such frameworks can significantly reduce AI "hallucinations" and ensure content is aligned with specific curriculum objectives.

AI as a Pedagogical Scaffolding and Feedback Instrument

Tan, Cheng, and Ling (2025) discuss how AI serves as a powerful scaffolding tool within CPD by providing individualized feedback and supporting practice-based learning. Tools like TeachFX, as examined by Demszky et al. (2025), apply automated discourse analytics to classroom audio, allowing educators to reflect on their own teaching quality and questioning strategies. Additionally, Lu, Zheng, et al. (2024) implemented ChatGPT-assisted training and found it significantly enhanced pre-service teachers' higher-order thinking skills and self-efficacy compared to traditional methods. This puts emphasis on how AI enhances the teaching and learning process by providing personalized support and timely feedback to students and educators alike. Hlede et al. (2024) emphasize that these learning theories serve a dual role, explaining how knowledge is constructed while functioning as mechanisms through which AI influences CPD outcomes.

Addressing the "Signal Gap" and Infrastructural Readiness in Digital Transformation

Oyelere and Aruleba (2025) describe the persistent digital divide in regions like Sub-Saharan Africa, where unequal access to technological resources hinders quality education. They refer to this systemic barrier as the "signal gap," noting that unstable internet connectivity in rural and remote regions prevents equitable digital transformation. This situation is not unique to the Philippine context, as similar signal and connectivity gaps are widely observed, particularly in Geographically Isolated and Disadvantaged Areas (GIDAs). These challenges persist to this day and continue to hinder access to essential digital services and opportunities for inclusive development. Leal Filho et al. (2026) argue that infrastructural readiness, including scalable data ecosystems and maintenance, is a prerequisite for sustainable AI integration. Their argument highlights that the use of AI cannot succeed through training and software availability alone. It requires robust, scalable, and

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well-maintained digital infrastructure that can continuously support data-intensive operations. Hlede et al. (2024) emphasize that Readiness is a dynamic pillar that depends on network alignment, and without robust infrastructure, individual teacher proficiency cannot be maintained at scale.

Ethical AI Governance and the "Black Box" Problem

Hlede et al. (2024) note that the lack of transparency in AI reasoning, often called the "black box" problem, poses significant risks to professional accountability. When educators rely on purely AI-generated recommendations without understanding the underlying reasoning, it becomes difficult to justify, verify, or defend those decisions if errors, biases, or harmful outcomes occur. Atias and Mawasi (2025) acknowledge that while ethics is recognized across programs, there is an urgent need for more explicit engagement with the ethical dimensions of AI literacy. The goal is to ensure the safe, ethical, and equitable use of such powerful technology, while also fostering a secure and supportive environment for both educators and learners. Additionally, Hlede et al. (2024) promote a "human-in-the-loop" philosophy through the ALEERRT-CA framework, ensuring that educators maintain the authority to question or override AI-generated outputs. This also helps humanize AI-generated outputs, making them more closely aligned with human reasoning, judgment, and contextual understanding. Tan, Cheng, and Ling (2025) add that ethical awareness must prioritize addressing technological challenges and bias mitigation to ensure the responsible integration of AI in education.

Fostering Human–AI Collaboration and Teacher Agency

Tan, Cheng, and Ling (2025) suggest a paradigm shift toward human–AI collaboration, where technology enriches rather than replaces the teacher's role. This is evident, as many educators today already use AI to support and streamline their routine tasks and day-to-day professional responsibilities, such as creation of their lesson plan. Meanwhile, Osman and Bashir (2026) discuss AI as a "democratizing force" that supports intercultural dialogue and inclusive learning when educators are properly trained. This highlights how AI tools can provide multilingual support, adaptive learning resources, and culturally responsive content, which allows learners from diverse linguistic and cultural backgrounds to engage more equitably in the learning process. This idea is supported by Hlede et al. (2024) which also explains that AI acts as a transformative agent that redistributes agency among humans and digital artifacts, allowing teachers to focus on more meaningful pedagogical tasks. However, technical training alone is insufficient. Successful integration requires combining pedagogical knowledge with positive organizational support and continuous professional development (Aravantinos et al., 2026).

Bridging the Digital Divide via Equitable Access

Leal Filho et al. (2026) examine AI's potential to bridge the gap to basic-needs sustainability, emphasizing that higher education institutions must align AI adoption with equity-oriented strategies. They highlight the role of redistributive governance, where institutions deliberately redirect AI-generated operational efficiencies toward student support initiatives like scholarships and basic-needs assistance. In this sense, the management must also commit and support the implementation and use of AI in the institution by drafting related policies. Additionally, Oyelere and Aruleba (2025) note that educators with more experience are often more critical of technological solutions, recognizing that tools alone will not solve complex social issues like educational inequality. Lastly, Osman and Bashir (2026) add that significant barriers to practical implementation often stem from insufficient training and faculty resistance in underserved regions. When educators lack sufficient exposure to AI tools or confidence in using them, they are less likely to integrate these technologies into their teaching practices. This resistance is further compounded by infrastructural limitations and uneven access to professional development, ultimately slowing down meaningful AI adoption in education systems.

Personalized and Adaptive Learning Paths

AI is reshaping professional development through personalized and adaptive learning paths by leveraging machine learning and predictive analytics to tailor training experiences to individual needs. These systems analyze learner performance and engagement data to adjust content difficulty, pacing, and sequencing, ensuring that training is aligned with specific competency gaps and professional requirements. Tusquellas, Palau, and Santiago (2024) further describe AI-enabled learning management systems as "intelligent guides" that continuously monitor progress and recommend appropriate learning activities, helping maintain optimal challenge and engagement. In addition, Tan, Cheng, and Ling (2025) emphasize that this data-driven personalization improves training efficiency by targeting specific skill deficiencies, while Hlede et al. (2024) highlight the value of "just-in-time learning," where AI provides immediate, context-

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relevant support during actual work tasks. Collectively, these perspectives illustrate how AI transforms traditional training into a dynamic, responsive, and continuously evolving learning ecosystem.

Methodology

Research Design

The study adopted a descriptive-quantitative research design. This methodological architecture is structured to analyze the alignment between capacity-building inputs—specifically the CPD-accredited AI training modules and measurable proficiency outputs, including the educators' post-training digital maturity, skill progression, and course development readiness. In educational program evaluations, a descriptive-quantitative framework is highly validated for mapping the baseline competencies and developmental outcomes of professional upskilling interventions without manipulating the active training environment.

Sampling Design

The research employed purposive sampling to select educator-participants who completed the DICT-led AI capacity-building programs across Region IX and the BASULTA (Basilan, Sulu, and Tawi-Tawi) provinces from March to May 2026. A purposive sampling technique is employed to ensure that respondents possess relevant knowledge and experience on the said capacity development. This approach ensures that the data collected are valid and directly aligned with the study variables. Moreover, this method allowed researchers to focus their data collection on individuals or groups who possessed the attributes or characteristics required for a comprehensive understanding of the research topic. Hence, through purposive sampling, the proponent aimed to create a sample that closely resembles a 'representative sample.' The research captured a total of 6,815 educator-participants.

Research Locale

The study was geographically and virtually situated within the administrative and developmental jurisdiction of the Department of Information and Communications Technology (DICT) Regional Office IX and BASULTA. This unique region spans the Zamboanga Peninsula (Region IX)—comprising the provinces of Zamboanga del Norte, Zamboanga del Sur, and Zamboanga Sibugay, alongside the highly urbanized Zamboanga City—and the island provinces of the BASULTA corridor (Basilan, Sulu, and Tawi-Tawi) in the southwestern seas of the Philippines.

Research Participants

The research participants consist of individuals located across DICT Region IX and the BASULTA islands, representing a diverse professional pool of licensed teachers, government employees, and students. This group is geographically distributed through Zamboanga City, the peninsula provinces, and the island regions of Basilan and Sulu, covering a wide generational span from 19 to over 60 years old. While the majority are mid-career educators and administrative staff, the participants possess varying levels of digital maturity, ranging from initial skepticism to highly motivated learners seeking CPD accreditation.

Research Instrument

The research instrument utilized in this study was an adaptation of the post-training evaluation tool by the Civil Service Commission (CSC), which aligns with the national standards. The tool is fundamentally rooted in Kirkpatrick's Evaluation Framework, specifically measuring Level 1 (Reaction) through feedback on administrative arrangements and Level 2 (Learning) by assessing the mastery of subject matter and instructional methodology. To ensure methodological validity and reliability, the instrument incorporates professional indicators functional to the Philippine Professional Standards for Teachers (PPST) using a 5-point Likert scale to establish a quantitative baseline for program effectiveness. Consistent with established research protocols, the tool's design was subject to expert review through the oversight of the DICT's instructional designers to ensure language clarity and relevance to the research objectives. The instrument is structured into distinct divisions beginning with demographic and administrative metadata, including age, sex, province, job position, email address, and unique identifiers like the Course ID and Unique Client ID Number (UCIDN)—all gated by a mandatory digital consent clause compliant with the Philippine Data Privacy Act of 2012 (DPA) and National Privacy Commission (NPC) advisory guidelines. The core evaluative engine of the survey comprises 15 closed-ended, 5-point Likert items (5 - Excellent to 1 - Poor) assessing four specific domains of trainer competency: Mastery of the Subject Matter (command of notes, topic organization, command over subject matter, and integration of current technological developments), Instructional Methodology (clarity of explanations, adequacy of exercises, use of aids, active engagement with alternative solutions, and time efficiency), Communication Skills (voice projection and fluency), and Classroom Management (interest

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maintenance, helpfulness, openness to criticism, and discipline control). These are supplemented by dedicated blocks evaluating Module Design (clarity of objectives and relevance), Course Objectives, Content, and Results (utility of new ideas, recommendation intent, objective achievement, content sufficiency, and pacing), and Administrative Arrangements (preparation, registration, information availability, and secretariat courtesy). Grounded in educational upskilling evaluation models, this instrument integrates qualitative, open-ended sections for recommendations, perceived training benefits, and future course topics, allowing for a robust Training Needs Analysis (TNA).

Data Gathering Procedure

To gather the necessary empirical data, the study executed a structured, three-phase digital data collection procedure beginning with institutional clearance and authorization, where formal request letters were submitted to the Regional Director of the Department of Information and Communications Technology (DICT) Region IX and BASULTA to secure official approval to utilize and evaluate standard training metrics in alignment with the agency's Quality Management System (QMS) protocols. Upon receiving clearance, the virtual survey administration and deployment phase was conducted synchronously at the culmination of the virtual, CPD-accredited webinar series, "AI Class ASEAN: Empowering Educators in the Age of Intelligence," held from March to May 2026, targeting educator-participants across the geographically isolated and disadvantaged areas (GIDA) of the Zamboanga Peninsula and the BASULTA island provinces. The Standard Post-Training Evaluation Questionnaire was administered exclusively via a secure Google Forms link disseminated by the DICT secretariat through the webinar live chat rooms and registered email threads. This deployment was accompanied by a mandatory digital consent clause embedded as the form's entry portal to inform participants of the data collection purpose, ensuring compliance with the Data Privacy Act of 2012 (RA 10173) and the National Privacy Commission (NPC) circulars. During the final secure digital ingestion phase, a "Privacy-by-Design" framework was applied to decouple email addresses and names from the primary dataset, segmenting the database using system-generated Unique Client ID Number (UCIDN), timestamp, and Course ID Number to preserve full respondent anonymity. The resulting anonymized structured data were subsequently stored in password-protected, encrypted cloud-based drives with access restricted solely to the primary research team, and all digital records were scheduled for permanent deletion through secure digital shredding protocols upon completion of the study's analytical phase.

Results and Discussions

Research Question 1: What is the level of participant proficiency across Modules 1-5 of the AI capacity-building program?

Table 1. Participant Proficiency Levels by Module Dimension (N=6,815)

Module Dimension	Mean Score	Verbal Description	Interpretation
Module 1: AI Fundamentals	4.91	Outstanding	Highly Proficient
Module 2: Prompt Engineering (PTCF)	4.97	Outstanding	Highly Proficient
Module 3: AI Productivity Tools	4.93	Outstanding	Highly Proficient
Module 4: AI for Critical Thinking	4.94	Outstanding	Highly Proficient
Module 5: Ethical Use of AI	4.98	Outstanding	Highly Proficient
Over-all Mean	**4.95**	**Outstanding**	**Highly Proficient**

The analysis revealed an outstanding level of proficiency across the large respondent pool, as reflected in Table 1, with an overall mean score of 4.95, indicating that the AI capacity-building program effectively enhanced participants' competencies across all five instructional modules. Module 5 (Ethical Use of AI) achieved the highest mean score (4.98), suggesting that regional educators were deeply committed to the responsible integration of technology, aligning with the Ethics pillar of the ALEERRT-CA framework proposed by Hlede et al. (2024). From a theoretical perspective, the prominence of ethical competence indicates that effective AI training should prioritize not only operational skills but also the development of professional judgment necessary for navigating the social and ethical implications of AI-assisted teaching. Furthermore, the high rating for Module 2 (4.97) demonstrated that the PTCF (Persona, Task, Context, Format) prompting framework was successfully mastered at scale. Participants reported that this structured approach allowed them to generate high-quality instructional materials, such as lesson plans and quizzes, with significantly

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reduced "hallucinations" from AI models. This proficiency indicated that educators had moved from basic AI awareness to functional literacy, a critical requirement for thriving in a "post-digital" society.

Research Question 2: What are the specific challenges encountered (e.g., connectivity, pacing) during the training sessions?

Table 2. Frequency and Intensity of Systemic Friction Points

Challenge Category	Frequency	Primary Barrier Identified
Internet Connectivity	Very High	"Signal gap" in island provinces (BASULTA) and rural Zamboanga.
Pacing and Tempo	Moderate	Pacing is occasionally perceived as "too fast" for non-tech-savvy users.
Access to Tools	Low	High data requirements for browser-based platforms like Suno AI.

Despite the high proficiency scores, the qualitative data from over 6,800 educators highlighted a persistent "signal gap" as the primary barrier to digital transformation, as illustrated in Table 2. This phenomenon, described by Oyelere and Aruleba (2025), was characterized as a defining feature of the digital divide in developing regions and manifested as internet instability that prevented synchronous participation and timely submission of evaluation outputs. Participants consistently noted that unstable connectivity hindered their ability to engage in real-time hands-on activities and submit requirements on schedule. This finding aligned with the Readiness pillar of the ALEERRT-CA model and the discussion of Hlede et al. (2024), which emphasized that individual proficiency must be complemented by infrastructural readiness. In other words, acquiring AI knowledge and skills alone is insufficient if educators lack reliable internet access, appropriate digital tools, and institutional support to fully engage in technology-enabled learning. Likewise, the challenges related to training pace suggest that learner readiness extends beyond infrastructure to include varying levels of prior digital literacy and confidence, indicating that participants progress through AI competencies at different rates. While large-scale training massification was efficient, future iterations should have included offline-compatible modules, as advocated by Tran et al., to ensure equitable access for educators in remote areas of Region IX and BASULTA.

Research Question 3: What is the baseline academic and proficiency metric of the participants relative to digital maturity?

Table 3. Baseline Overall Program Assessment Summary

Evaluation Indicator	Mean Score	Verbal Description	Interpretation
Mastery of Subject Matter	4.95	Outstanding	Highly Effective
Instructional Methodology	4.92	Outstanding	Highly Effective
Communication Skills	4.97	Outstanding	Highly Effective
Classroom Management	4.9	Outstanding	Highly Effective
Over-all Mean	**4.94**	**Outstanding**	**Highly Effective**

Table 3 confirmed the exceptional quality of the "Digital Teacher Masterclass" (Mean = 4.94), providing empirical evidence of a successful sociotechnical intervention as conceptualized in the ALEERRT-CA framework proposed by Hlede et al. (2024). The program was highly effective in establishing participants' digital maturity and AI competencies. Resource speakers were rated 4.95 for Mastery of Subject Matter, with participants specifically praising their ability to "inject current developments relevant to the course." This strongly reflected the competency that Tan, Cheng, and Ling (2025) identified as essential for helping teachers remain up to date with the latest AI developments and professional needs. The instructional methodology, which utilized interactive tools like Notebook LM and Quick Draw, was highly valued for its ability to foster learner readiness and engagement. This success validated the Learning Theories pillar of the ALEERRT-CA framework, indicating that the program effectively transitioned from traditional lecture-based training to an adaptive, data-driven learning experience. Consequently, the findings suggest that participants' high levels of proficiency were not solely the result of the AI content itself but were also influenced by the quality of instruction and the adoption of effective pedagogical strategies, highlighting the important role of sound instructional design in achieving meaningful and sustainable AI competency development.

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Research Question 4: Is there a significant difference in proficiency levels when participants are grouped according to their demographic profiles?

Table 4: Inferential Analysis of Proficiency Group Differentials

Grouping Variable	F-value / t-value	p-value	Interpretation
Batch/Cohort	1.08	0.345	Not Significant
Province (Peninsula vs. Islands)	0.92	0.39	Not Significant
Sex (Male vs. Female)	0.51	0.612	Not Significant
Job Position	1.12	0.305	Not Significant

Statistical analysis, as presented in Table 4, showed no significant differences ($p > .05$) in participants' proficiency levels when grouped according to batch, province, sex, or job position. From a theoretical perspective, these findings reinforce the premise of the ALEERRT-CA framework proposed by Hlede et al. (2024), particularly its Learning Theories and Readiness pillars, which suggest that when AI capacity-building is designed using learner-centered, accessible, and well-structured instructional approaches, learning outcomes are not inherently constrained by demographic characteristics. The results also support the view of Osman and Bashir (2026) that AI, when supported by effective educator training, can serve as a democratizing force that promotes inclusive learning opportunities regardless of geographic or personal differences. Although educators from remote areas, such as the BASULTA islands, faced greater infrastructural challenges, they ultimately achieved proficiency levels comparable to those of participants from urban centers, demonstrating that demographic factors alone did not determine learning success. Instead, the findings suggest that equitable, theory-driven, and CPD-accredited training programs can minimize disparities in AI competency development by providing consistent learning experiences across diverse participant groups. This further supports the argument of Oyelere and Aruleba (2025) that targeted capacity-building initiatives can help bridge digital inequalities and promote more inclusive digital transformation, even in geographically isolated and disadvantaged communities.

Research Question 5: Based on the results, what pedagogical innovation or course development framework can be proposed to enhance digital skills?

Table 5. Action Framework for "Competency-Based Technology Skills Enhancement Workshop"

Feature	Targeted Result	Implementation Strategy
Subject-Specific AI	Specialized Integration	Hands-on labs for AI in Math, Science, and English.
Offline AI Tools	Bridge the Signal Gap	Deployment of local AI models and downloadable training packages.
Advanced Prompting	Content Mastery	Moving from "AI discovery" to "AI engineering" for complex design.

The proposed “Competency-Based Technology Skills Enhancement Workshop” provided a strategic framework for advancing educators from basic AI awareness to AI mastery, addressing both the competency gaps and implementation challenges identified in the study. The framework reinforces the Learning Theories and Readiness pillars of the ALEERRT-CA framework proposed by Hlede et al. (2024), emphasizing that effective AI capacity-building should be continuous, context-sensitive, and responsive to learners' evolving professional needs. The inclusion of hands-on, discipline-specific activities aligns with the constructivist perspective of Atias and Mawasi (2025), which asserts that meaningful learning occurs when participants actively construct knowledge through authentic and relevant experiences. Likewise, the progression from basic prompting to advanced prompt engineering supports the argument of Aravantinos et al. (2026) that professional development must extend beyond introductory training to develop higher-order competencies that can be transferred into classroom practice. Overall, the proposed framework extends the ALEERRT-CA model from an evaluation framework into a practical course development model, illustrating how theory-informed, competency-based interventions can foster continuous digital skills enhancement and support long-term AI integration in education, particularly in geographically isolated and disadvantaged areas.

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Ethical Considerations

To ensure the absolute protection of human and organizational rights, this study strictly adhered to established ethical guidelines, commencing with an active digital informed consent gateway embedded directly within the standard DICT Post-Training Evaluation Form in compliance with the Data Privacy Act of 2012 (Republic Act No. 10173) and the National Privacy Commission (NPC) advisory standards (NPC, 2024). Educator-participants were fully informed of the academic purpose, voluntary nature, and risk-free right to withdraw from the evaluation prior to submitting their responses, with absolute confidentiality being guaranteed by separating personal identifiers, specifically the certificate name and email fields shown in the instrument and utilizing system-generated UCIDN identifiers for statistical profiling (Tupaz et al.). Concurrently, to safeguard organizational and cybersecurity protocols within the DICT Region IX and BASULTA network, any sensitive ICT infrastructure metrics, system architectures, or operational practices obtained during the March to May 2026 webinars were strictly amalgamated and presented in a generalized, non-attributable format. By enforcing these dual-layer privacy-by-design and non-disclosure safeguards, the research ensured the academic integrity of the course development process while completely insulating both individual respondents and regional government systems from identification, vulnerability exposure, or unauthorized data misuse (DLA Piper, 2025; Aguda, 2025).

Conclusion

The assessment of the "Digital Teacher Masterclass" demonstrated that Continuing Professional Development (CPD) accredited programs were highly effective in elevating regional digital proficiency to an "Outstanding" level (Overall Mean = 4.95). Participants successfully transitioned from basic AI awareness to functional mastery of generative tools, specifically through the PTCF (Persona, Task, Context, Format) framework, which Tan, Cheng, and Ling (2025) identified as a vital competency for optimizing instructional content creation in the classroom. The study also revealed that the program achieved a level of equitable digital transformation, as statistical analysis yielded no significant differences ($p > .05$) in proficiency based on age, sex, or geographic location. While individual AI literacy and self-efficacy were high, aligning with the Literacy and Ethics pillars of the ALEERRT-CA framework proposed by Hlede et al. (2024), the persistent "signal gap" and internet instability in the remote island provinces of BASULTA remained critical systemic bottlenecks. This structural barrier confirmed that Readiness is a multi-layered state where individual competence must be supported by infrastructural alignment to avoid reinforcing the digital divide. Furthermore, Atias and Mawasi (2025) emphasized that achieving Critical AI Literacy required educators to maintain a "human-in-the-loop" philosophy to mitigate algorithmic bias and preserve professional autonomy. Ultimately, while the region's educators were pedagogically ready to lead in a post-digital landscape, their long-term success was contingent upon institutional leadership bridging the gap between individual proficiency and infrastructural readiness.

Recommendations

Based on these findings, it is recommended that policy officials at the DICT Region IX and BASULTA and relevant educational bodies prioritize regional infrastructure investments and the deployment of offline-compatible AI tools to mitigate the "signal gap" that hinders inclusive digital capability-building. To ensure consistency, DICT may also consider integrating the findings of this study into its standard Continuing Professional Development (CPD) training framework by incorporating region-specific case studies, and contextualized learning activities that reflect the needs of educators in the Region. The institution should also move beyond general awareness by institutionalizing a highly structured "Competency-Based Technology Skills Enhancement Workshop" that focuses on performance-based, subject-specific AI applications—such as AI for Math and Science, while implementing formal classroom "Codes of Conduct" to ensure academic integrity. This step will encourage educators to transition from "AI discovery" to "AI mastery" by pursuing advanced, hands-on certifications that treat technology as a supportive partner rather than a replacement for human pedagogical judgment. Complementing this initiative, the establishment of a centralized repository of validated AI training modules, instructional resources, best practices, and exemplar lesson plans is recommended to standardize the quality of AI capacity-building programs across regional offices while allowing for contextual adaptation to local educational settings. Moreover, future course development should incorporate self-paced learning modules and collaborative peer-learning circles to facilitate iterative reflection and the "co-editing" of AI outputs, ensuring that the digital transformation in Region IX and BASULTA remains sustainable and responsive to evolving technological trends. Finally, future researchers are encouraged to conduct longitudinal and mixed-method studies that extend beyond immediate post-training evaluations to examine the long-term effects of AI capacity-building on classroom instruction, teacher competency, learner outcomes, and sustained AI adoption. Tracking educators over time would provide stronger evidence of whether the competencies acquired during CPD-accredited AI training translate into

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meaningful instructional practice and contribute to continuous digital transformation within Philippine education.

References

Aguda, H. (2025). Navigating AI ethics and governance in the Philippine educational landscape.

Aravantinos, S., Lavidas, K., Komis, V., & Karalis, T. (2026). Artificial Intelligence in K-12 Education: A Systematic Review of Teachers' Professional Development Needs for AI Integration. *Computers, 15*(1), 49. https://doi.org/10.3390/computers15010049

Atias, O., & Mawasi, A. (2025). Conceptualizing AI literacies for children and youth: A systematic review on the design of AI literacy educational programs. *Computers and Education: Artificial Intelligence, 9*, 100491. https://doi.org/10.1016/j.caeai.2025.100491

Bais, R. L. (2026). The impact of technological skills on students' academic performance: Foundations for pedagogical innovation. *International Journal of Research on Multidisciplinary Studies, 1*, 6-18. https://doi.org/10.5281/zenodo.18627046

Demszky, D., Liu, J., Hill, H. C., Sanghi, S., & Chung, A. (2025). Automated feedback improves teachers' questioning quality in brick-and-mortar classrooms: Opportunities for further enhancement. Computers & Education, 227, 105183. https://doi.org/10.1016/j.compedu.2024.105183

Department of Information and Communications Technology (DICT). (2026b). *Digital teacher masterclass - unlocking AI.mazing transformation in education: Instructional design*.

Department of Information and Communications Technology. (2021). *National Artificial Intelligence Strategy Roadmap 2.0*. https://dict.gov.ph

DLA Piper. (2025). Artificial intelligence global regulation guide 2025.

Ensign, D., Nisly, S. A., & Pardo, C. O. (2024). The Future of Generative AI in Continuing Professional Development (CPD): Crowdsourcing the Alliance Community. *Journal of CME, 13*(1), 2437288. https://doi.org/10.1080/28338073.2024.2437288

Hlede, V., Valanci, S., D'Antuono, G. R., Dow, H., Wiggins, R., & O'Beirne, R. (2024). AI-enhanced CPD as an evolving sociotechnical system: A multi-method theoretical framework development study. *JMIR Medical Education*. (Preprint 69156). https://doi.org/10.2196/preprints.69156

Kitcharoen, P., Howimanporn, S., & Chookaew, S. (2024). Enhancing Teachers' AI competencies through artificial intelligence of Things professional development training. *International Journal of Interactive Mobile Technologies (iJIM), 18*(2), 4–15. https://doi.org/10.3991/ijim.v18i02.46613

Kirkpatrick, J. D., & Kirkpatrick, W. K. (2016). Kirkpatrick's four levels of training evaluation. Association for Talent Development.

Leal Filho, W., Sigahi, T. F., Skouloudis, A., Rampasso, I. S., & Anholon, R. (2026). Beyond the hype: A sociotechnical perspective on AI's potentials and constraints in bridging the gap to basic-needs sustainability in higher education institutions. *Technological Forecasting & Social Change, 228*, 124681. https://doi.org/10.1016/j.techfore.2026.124681

Lu, J., Zheng, R., Gong, Z., & Xu, H. (2024). Supporting teachers' professional development with generative AI: The effects on higher order thinking and self-efficacy. IEEE Transactions on Learning Technologies, 17, 1279–1289. https://doi.org/10.1109/TLT.2024.3369690

Nathaniel, J., Oyelere, S. S., Suhonen, J., & Tedre, M. (2025). Literature Review on the Integration of Generative AI in Programming Education. *International Journal of Artificial Intelligence in Education, 35*, 2724–2755.

Ng, D. T. K., Leung, J. K. L., Chu, S. K. W., & Qiao, M. S. (2021). Conceptualizing AI literacy: An exploratory review. Computers and Education: Artificial Intelligence, 2, Article 100041. https://doi.org/10.1016/j.caeai.2021.100041

OECD. (2019). OECD future of education and skills 2030: OECD learning compass 2030. https://www.oecd.org/content/dam/oecd/en/about/projects/edu/education-2040/1-1-learning-compass/OECD_Learning_Compass_2030_Concept_Note_Series.pdf

Olatunji, E. K., Oladosu, J. B., Odejobi, O. A., & Olabiyisi, S. O. (2021). Design and implementation of an African native language-based programming language. International Journal of Advances in Applied Sciences, 10(2), 171–177. https://doi.org/10.11591/ijaas.v10.i2.pp171-177

Osman, S., & Bashir, R. (2026). Utilizing AI tools to achieve global citizenship: Cross-cultural collaboration and sustainable development goals awareness in higher education in the UAE. *Social Sciences & Humanities Open, 13*, 102544. https://doi.org/10.1016/j.ssaho.2026.102544

Oyelere, S. S., & Aruleba, K. (2025). A comparative study of student perceptions on generative AI in programming education across Sub-Saharan Africa. *Computers and Education Open, 8*, 100245. https://doi.org/10.1016/j.caeo.2025.100245

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https://ijroms.com
Original Article

Republic of the Philippines. (2012). Republic Act No. 10173: The Data Privacy Act of 2012.

Tan, X., Cheng, G., & Ling, M. H. (2025). Artificial intelligence in teaching and teacher professional development: A systematic review. *Computers and Education: Artificial Intelligence, 8*, 100355. https://doi.org/10.1016/j.caeai.2024.100355

Tupaz, E., et al. (2025). Data privacy and AI integration: Legal frameworks for 21st-century education.

Tusquellas, N., Palau, R., & Santiago, R. (2024). Current applications of artificial intelligence in professional development. *International Journal of Information Management Data Insights, 4*, 100288. https://doi.org/10.1016/j.jjimei.2024.100288

United Nations Educational, Scientific and Cultural Organization. (2021). Recommendation on the Ethics of Artificial Intelligence. UNESCO. https://unesdoc.unesco.org/ark:/48223/pf0000381137

