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## ARTIFICIAL INTELLIGENCE IN THE TEACHING PROCESS IN PUBLIC ELEMENTARY SCHOOLS

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### ABSTRACT

*The study surveyed 341 public elementary teachers in Region I regarding their awareness, utilization, integration, challenges, and opportunities related to AI use in teaching. It also examined the correlations between these factors and teacher demographics and the perception gaps between them and the school heads. Most teachers were female, middle-aged, married, and graduate-educated. Teachers showed moderate AI awareness (higher for general concepts) and use (ChatGPT was the highest), with many reporting limited use. Both groups rated integration as moderate (strongest in resources and lesson design) but identified barriers, including ethical/societal issues, technical issues, and skills gaps. Yet they saw great potential for student engagement, assessment, and innovation. Integration was significantly correlated with age, sex, education, experience, and training. Teachers and heads shared their perceptions, highlighting the need for inclusive training, policy support, and ethical standards in basic education.*

*Keywords: Artificial Intelligence, Ethical and Societal Issues in AI Use, Technological Pedagogical Integration, Instructional Innovation using AI*

### INTRODUCTION

AI (AIED) is revolutionizing education through personalized learning, automation, differentiated instruction, and real-time feedback. Yet, adoption is sluggish in Philippine public elementary schools, particularly in rural areas, due to infrastructure, training, and support gaps.

DepEd announced the establishment of the National Center for Artificial Intelligence in Education (NCAIE) in February 2025 to promote AI research, training, and policy. Local research (Agbong-Coates, 2024) reveals that tools such as ChatGPT enhance teaching and results but awareness outpaces usage due to access to training, technological infrastructure and policies. The study sought to determine the perception of Region I public elementary school teachers and school heads on the use of AI in teaching in addressing equity challenges.

### Statement of the Problem

This study was conducted to assess the extent of Artificial Intelligence integration in the teaching practices of public elementary school teachers in Region I.

Specifically, it aims to:

1. Describe the profile of teacher-respondents in terms of demographic and professional characteristics;
2. Determine the level of awareness of AI tools in the teaching process;
3. Assess the level of utilization of AI tools among teachers;
4. Evaluate the extent of AI integration in teaching as perceived by both teachers and school

heads in the areas of:

- a. Planning and management of teaching and learning
  - b. Planning of learning outcomes aligned with curriculum
  - c. Learning programs
  - d. Professional collaboration
  - e. Teaching resources
5. Identify the level of seriousness of problems encountered in AI integration, including:
    - a. Technical challenges
    - b. Teacher readiness and skills
    - c. Pedagogical concerns
    - d. Ethical and societal concerns
  6. Explore the opportunities for AI integration in the teaching process;
  7. Examine the relationship between the extent of AI integration and the respondents' profiles; and
  8. Determine significant differences in AI integration perceptions between teachers and school heads;
  9. Propose curriculum enhancement inputs based on the study's findings.

### Scope and Delimitations

The study looked into the application of AI in the instruction of public elementary teachers in the four provinces of Region 1 for AY 2024-2025, considering teacher profiles (age, sex, education, specialization, number of tech-trainings) and the use of AI under PPST Domain 4 (curriculum integration and lesson planning). It also discussed challenges in the use of AI. A Scopus search of "AI in Education" yielded only 144 Philippine studies, mostly at the tertiary level, with little to no elementary level research so the scope was narrowed down to elementary teaching to fill this gap.

### Review of Related Literatures

This section presents a synthesis of relevant national and international literature that provides a foundation for understanding the integration of Artificial Intelligence (AI) in basic education and curriculum enhancement. Both local and international sources were reviewed to identify research gaps and guide the present study.

### Related Literature

National literature highlights the efforts of the Department of Education in integrating technology in education through policies such as DepEd Order No. 013, s. 2025 establishing the Education Center for Artificial Intelligence Research (E-CAIR) and the implementation of the Matatag Curriculum. These initiatives emphasize digital literacy, innovation, and future-ready skills in basic education.

International literature from organizations such as UNESCO and OECD shows that AI is transforming education through personalized learning, intelligent tutoring systems, and automated instructional support. Countries like the United States, China, Finland, and South Korea have integrated AI into curriculum reforms and teaching systems, highlighting global efforts toward digital transformation in education.

### Artificial Intelligence in Education

Artificial Intelligence is a branch of computer science that enables machines to perform human-like tasks such as learning, decision-making, and problem-solving (Tecuci, 2012; Haenlein & Kaplan, 2019). In education, AI supports adaptive learning, automated assessment, and

intelligent tutoring systems, improving both teaching efficiency and student learning outcomes (Zawacki-Richter et al., 2019; Kumar et al., 2024).

### **Integration of AI in Education**

AI integration in education enhances instructional delivery through personalized learning, automated feedback, and improved accessibility (Alqahtani & Wafula, 2024; Bozkurt et al., 2021). However, challenges such as data privacy, ethical concerns, and digital divide issues remain significant barriers to effective implementation (Mortlock & Lucas, 2024).

### **DepEd Initiatives**

The Department of Education has launched several initiatives to support AI integration, including E-CAIR and partnerships with educational technology providers such as Microsoft and Khan Academy. These programs aim to strengthen digital competencies, promote ethical AI use, and enhance teaching and learning processes (DepEd, 2025).

### **AI in Rural Education**

Studies show that rural schools face challenges such as limited infrastructure, lack of training, and low AI literacy among teachers and students (Villarino, 2025). This digital divide highlights the need for inclusive policies and equal access to AI-based educational tools and training.

### **Related Studies**

Research indicates that AI improves teaching efficiency, student engagement, and institutional productivity (Giray et al., 2024; Jala, 2025). However, issues such as ethical concerns, academic integrity, and teacher readiness affect its implementation. Teacher digital competence and training significantly influence successful AI adoption in education (Galindo-Domínguez et al., 2024).

### **Theoretical Framework**

The study on the extent of utilization of artificial intelligence in teaching among the public elementary school teachers is grounded on the Technology Acceptance Model and Diffusion of Innovations Theory. The Technology Acceptance Model explains the acceptance and use of AI in teaching by teachers through perceived usefulness and perceived ease of use. The Diffusion of Innovations Theory, on the other hand, describes the adoption of new technologies through relative advantage, compatibility, complexity, trialability, and observability. These theories served as the basis for the study of the use, factors affecting, and problems of integrating AI in the teaching-learning process in public elementary schools.

### **Conceptual Framework**

This study is anchored on the Department of Education Digital Rise Program, which promotes the integration of Information and Communication Technology (ICT) in the Philippine basic education system through ICT infrastructure, ICT-assisted teaching, and ICT-assisted learning. The research is directed to the ICT-Assisted Teaching component, which is intended to enhance instructional practices through the development of teachers' digital competences and use of educational technologies. In line with this initiative, the research explored the utilization of Artificial Intelligence (AI) tools among public elementary school teachers, covering their awareness, preparedness, institutional support and challenges encountered in the use of AI. Also, the study used the Input-Process-Output Model as its conceptual framework. Inputs were respondents' profile, awareness and utilization of AI, challenges faced; process involved data collection, validation and statistical analysis; outputs were evidence based recommendations and

proposals for curriculum enhancement for effective integration of AI in public elementary education.

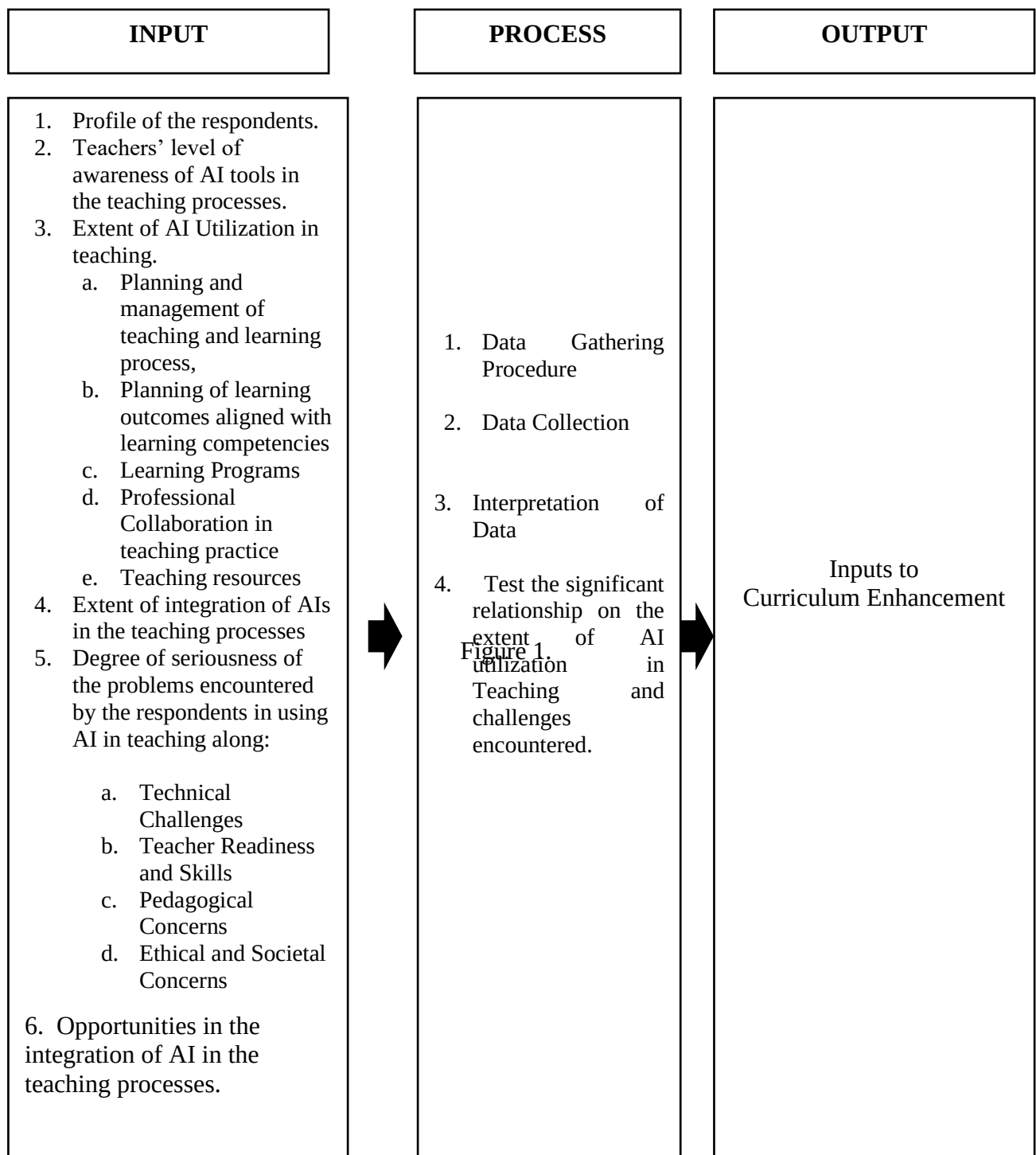
## **METHODOLOGY**

This research utilized a descriptive-correlational quantitative design. The descriptive component captured respondent profiles, awareness levels, AI utilization, and perceived challenges and opportunities, while the correlational part examined relationships between variables and differences in perceptions.

The study involved 341 teachers and 250 school heads from four provinces in Region I: Ilocos Norte, Ilocos Sur, La Union, and Pangasinan. Proportional cluster random sampling was used to ensure fair representation.

The research instrument was a structured survey questionnaire with five parts: respondent profile, level of AI awareness, extent of AI utilization, integration in teaching practices (based on Domain 4 of the Philippine Professional Standards for Teachers), and challenges encountered. Content validity was ensured through expert review, and the instrument was approved by the PSU Ethics Committee.

Data collection was conducted through printed forms or secure digital platforms (Google Forms/Microsoft Forms). Ethical standards such as informed consent and anonymity were observed.



**Paradigm of the Study**

### Research Design

This study employed a descriptive-correlational quantitative research design to determine the level of awareness, extent of utilization, integration, opportunities, and challenges encountered by public elementary school teachers and school heads in the use of Artificial Intelligence (AI) in teaching processes in Region I, Philippines.

The descriptive aspect of the study focused on gathering and presenting data regarding the respondents' profile in terms of age, sex, civil status, highest educational attainment, specialization, current position, and number of trainings or seminars attended related to AI and technology integration in teaching. It also described the respondents' level of awareness, extent of AI utilization and integration, opportunities provided by AI, and challenges encountered in the teaching-learning process.

The correlational aspect of the study examined the significant relationships between the respondents' profile variables and the extent of AI utilization and integration in teaching. It also determined whether significant differences existed between the perceptions of teachers and school heads regarding AI integration in the teaching process.

The study utilized a structured survey questionnaire composed of multiple-choice and Likert-scale items. Statistical tools such as frequency count, percentage, weighted mean, standard deviation, Spearman rank correlation, point biserial correlation, and Multivariate Analysis of Variance (MANOVA) were employed in the analysis and interpretation of data.

Through this methodological approach, the study aimed to provide a comprehensive understanding of the current state of AI integration in public elementary education and contribute relevant insights to the implementation of educational technology initiatives, particularly DepEd's Digital Rise Program.

### **Research Steps**

After conducting a comprehensive review of related literature and studies on Artificial Intelligence (AI) integration in education, the research design was carefully developed to align with the objectives of the study and the educational context of public elementary schools in Region I, Philippines.

The study employed a descriptive-correlational quantitative research design to determine the level of awareness, extent of utilization and integration, opportunities, and challenges encountered by teachers and school heads in the use of AI in teaching processes.

The researcher developed and validated a structured survey questionnaire composed of multiple-choice and Likert-scale items to gather relevant data from the respondents. Prior to data collection, ethical clearance and necessary permissions were secured from the PSU Research Ethics Committee, the Department of Education Regional Office I, and the respective Schools Division Offices. Using proportional cluster random sampling, the researcher selected teacher and school head respondents from the provinces of Ilocos Norte, Ilocos Sur, La Union, and Pangasinan.

The questionnaires were administered through printed copies and online platforms such as Google Forms and Microsoft Forms. After the retrieval of the accomplished questionnaires, the collected data were organized, tabulated, encoded, and analyzed using appropriate statistical tools, including frequency count, percentage, weighted mean, Spearman rank correlation, point biserial correlation, and Multivariate Analysis of Variance (MANOVA), to ensure accurate interpretation of the findings and attainment of the study objectives.

### **Data Collection and Sample Selection**

The data collection process commenced with the development and validation of a structured survey questionnaire adapted from related literature and aligned with the objectives of the study. The instrument was reviewed by research experts and school administrators to ensure validity and appropriateness. The questionnaire was designed to gather data on the respondents' profile, level of awareness of Artificial Intelligence (AI), extent of AI utilization and integration in teaching, and the challenges encountered in AI implementation.

After securing ethical clearance from the PSU Research Ethics Committee and obtaining approval from the Department of Education Regional Office I and the respective Schools Division Offices, the researcher proceeded with the selection of respondents through coordination with school heads and ICT coordinators. The survey was then administered to public elementary school teachers using both printed questionnaires and online platforms such as Google Forms and Microsoft Forms, depending on the accessibility of the schools. Each participant was given sufficient time to accomplish the questionnaire, and informed consent was obtained prior to participation. The data gathering process was conducted over a period of approximately three to four weeks, with follow-ups conducted to ensure a high response rate. Upon completion of data collection, all responses were retrieved, checked for completeness, encoded, and prepared for statistical analysis while maintaining strict confidentiality and anonymity of respondents.

### Data Analysis Methods

The data analysis employed statistical procedures, wherein responses from public elementary school teachers and school heads were systematically organized, tabulated, and analyzed according to the research problems. Descriptive statistics such as frequency, percentage, and weighted mean were used to determine the respondents' profile, level of awareness, extent of AI utilization and integration, perceived opportunities, and seriousness of challenges encountered. Correlational and inferential analyses, including Spearman rank correlation, point biserial correlation, and MANOVA, were used to examine relationships and differences among variables. The results were carefully interpreted and cross-checked to ensure the accuracy, reliability, and validity of the findings.

### Research Hypotheses and Validation

Furthermore, it is hypothesized that there is a significant relationship between the respondents' profile variables (such as age, sex, educational attainment, specialization, position, and AI-related trainings) and the extent of Artificial Intelligence (AI) utilization and integration in teaching among public elementary school teachers and school heads in Region I. It is also posited that there is a significant difference between the perceptions of teachers and school heads regarding the extent of AI integration in instructional processes, as well as a measurable variation in how AI tools are utilized across different teaching domains. The validity of these assumptions was tested using appropriate statistical tools, including Spearman rank correlation, point biserial correlation, and Multivariate Analysis of Variance (MANOVA), to ensure the reliability and accuracy of the findings.

### Study Limitations and Ethical Considerations

The study followed ethical protocols by securing ethical clearance from the PSU Research Ethics Committee and obtaining permission from the Department of Education Regional Office I and the respective Schools Division Offices before data collection. Informed consent was obtained from all participants, and participation was entirely voluntary, with respondents given the right to withdraw from the study at any time without penalty. Anonymity and confidentiality were strictly preserved, and no identifying information was revealed in the presentation of findings. Other ethical considerations included the handling of data in a responsible manner and the respectful representation of the views and experiences of the respondents in the analysis and reporting of results.



## RESULTS AND DISCUSSION

### ***SOP 1. Describe the profile of teacher-respondents in terms of demographic and professional characteristics***

Quantitative findings revealed that the teacher and school head respondents in public elementary schools in Region I are generally in their middle adulthood stage, predominantly female, and mostly married. In terms of professional qualifications, most respondents are college graduates, with a considerable number having earned master's units or completed graduate degrees, indicating a relatively high level of academic preparation.

In terms of specialization, respondents come from diverse subject areas such as English, Mathematics, Science, and General Education, reflecting a varied instructional background. However, most respondents reported having attended only a limited number of AI-related trainings or seminars, indicating that exposure to Artificial Intelligence in education is still at an early stage.

***Overall, the profile suggests that while respondents are professionally qualified and experienced educators, their direct exposure to AI-specific capacity building remains limited, which may influence their readiness for full AI integration in teaching.***

### ***SOP 2. Determine the level of awareness of AI tools in the teaching process***

Findings revealed that teachers and school heads have a moderate level of awareness of AI tools in the teaching process.

Respondents showed greater awareness of general AI concepts in education, particularly its role in enhancing instruction and supporting teaching tasks. However, awareness of specific AI tools and applications used in lesson planning, classroom instruction, and assessment was relatively limited.

In addition, awareness of institutional policies, programs, and structured support systems for AI integration was also found to be lower compared to general awareness. This indicates that AI awareness among educators is still developing and largely conceptual rather than practical.

***Overall, the results suggest that while AI is already recognized as an educational innovation, deeper understanding of its specific applications in teaching and learning is still needed.***

### ***SOP 3. Assess the level of utilization of AI tools among teachers***

Results showed that the level of AI utilization among teachers is generally moderate.

AI tools are commonly utilized in lesson planning, preparation of instructional materials, and alignment of learning outcomes with curriculum standards, particularly the Most Essential Learning Competencies (MELCs).

However, utilization is relatively lower in advanced instructional applications, such as AI-assisted assessment, adaptive learning systems, and data-driven instructional decision-making. This suggests that AI is primarily used as a support tool rather than a fully integrated instructional system.



***Overall, the findings indicate that while teachers are already using AI tools in their teaching practice, their use remains at a basic to intermediate level.***

#### ***SOP 4. Evaluate the extent of AI integration in teaching***

Findings revealed that the extent of AI integration in teaching, as perceived by teachers and school heads, is moderate across all domains.

- a. Planning and management of teaching and learning: AI is moderately integrated in instructional planning and classroom management, particularly in organizing lesson content and instructional flow.
- b. Planning of learning outcomes aligned with curriculum: Respondents reported moderate integration of AI in aligning learning outcomes with curriculum standards, especially MELCs-based planning.
- c. Learning programs: AI integration in designing or enhancing learning programs is present but not yet fully developed or institutionalized.
- d. Professional collaboration: AI is less frequently used in professional collaboration among teachers, school heads, and stakeholders, indicating limited collaborative digital practices.
- e. Teaching resources: Respondents reported moderate use of AI-powered teaching resources, but traditional materials are still more commonly used.

***Overall, AI integration is present but not yet deeply embedded in the teaching and learning system, indicating an early stage of institutional adoption.***

#### ***SOP 5. Identify the level of seriousness of problems encountered in AI integration***

Findings revealed that the problems encountered in AI integration are generally perceived as moderately serious.

- a. Technical challenges: Respondents reported issues such as limited internet connectivity, insufficient devices, and lack of technical infrastructure.
- b. Teacher readiness and skills: A significant concern was the limited training and insufficient skills of teachers in using AI tools effectively.
- c. Pedagogical concerns: Teachers expressed challenges in integrating AI meaningfully into instructional strategies without compromising learning outcomes.
- d. Ethical and societal concerns: Concerns include data privacy, responsible use of AI, and possible overdependence on technology.

***Overall, the results indicate that while AI integration is feasible, several structural, technical, and capacity-related challenges must be addressed.***

***SOP 6. Explore the opportunities for AI integration in the teaching process***

Findings revealed that respondents perceived strong opportunities for AI integration in education.

AI was viewed as highly beneficial in enhancing instructional efficiency, improving lesson planning, and supporting personalized learning. It was also seen as a tool that can help improve teacher productivity and learner engagement.

***Overall, respondents expressed a positive outlook toward AI, recognizing its potential to transform teaching and learning despite existing challenges.***

***SOP 7. Examine the relationship between the extent of AI integration and the respondents' profiles***

Correlation analysis revealed that certain profile variables are significantly related to the extent of AI integration.

Specifically, highest educational attainment and number of AI-related trainings/seminars showed a significant relationship with AI integration practices. This implies that more educated teachers and those with greater exposure to AI training are more likely to integrate AI into their teaching.

However, variables such as age, sex, and civil status showed no significant relationship with AI integration. This suggests that demographic factors do not strongly influence AI adoption in teaching.

***Overall, professional development exposure plays a more critical role than demographic characteristics in AI integration.***

***SOP 8. Determine significant differences in AI integration perceptions between teachers and school heads***

Findings revealed a significant difference in perceptions between teachers and school heads regarding AI integration in teaching processes.

School heads generally reported a higher level of AI integration compared to teachers. This may be attributed to their involvement in administrative planning, exposure to policy implementation, and broader institutional perspectives.

***This result indicates a perception gap between implementers and administrators, suggesting the need for alignment in understanding and implementation of AI in schools.***

***SOP 9. Propose curriculum enhancement inputs based on the study's findings***

Based on the findings, curriculum enhancement inputs are proposed focusing on:

Strengthening AI literacy and digital competency training for teachers and school heads  
Integrating AI concepts in professional development programs and in-service training (INSET)

Enhancing curriculum planning frameworks to include structured AI-supported instructional strategies

Developing clear institutional guidelines for ethical and effective AI use in classrooms  
Promoting collaborative learning communities for sharing AI-based teaching practices

***These inputs aim to support the gradual and effective integration of Artificial Intelligence in public elementary education, ensuring alignment with curriculum standards and 21st-century learning demands.***

## SUMMARY

The study on Artificial Intelligence in the Teaching Process in Public Elementary Schools among public elementary school teachers and school heads in Region I presents a comprehensive picture of the present state of Artificial Intelligence (AI) integration in teaching and learning processes. The findings revealed that the respondents were predominantly middle-aged women, married and professionally qualified. Most of the respondents had college degrees or graduate education. But the exposure to AI-related trainings is limited, which indicates that capacity building on AI literacy for educators is still in its nascent stages.

Teachers and school heads showed a moderate awareness of AI tools in education, with a better understanding of general AI concepts than of specific applications and institutional support systems. Moreover, the employment of AI in teaching practices was moderate, with teachers primarily employing AI tools for lesson planning, preparation of teaching materials, and curriculum alignment, but sophisticated uses such as AI-supported assessment and data-driven instruction are still limited.

The extent of AI integration across teaching domains was evaluated as moderate. The highest integration was observed in teaching resources and curriculum alignment while planning and professional collaboration had relatively low implementation. The findings show that the use of AI at present is as an additional teaching aid, and not fully integrated into the teaching and learning

In terms of challenges, respondents identified technical, pedagogical, readiness, and ethical concerns, with ethical and societal issues emerging as the most serious. Despite these challenges, respondents expressed strong recognition of AI's potential to enhance instructional efficiency, improve assessment practices, support learner engagement, and promote teacher professional development.

In addition, statistical analysis also showed a significant correlation between the adoption of AI and educational attainment and participation in AI-related trainings, suggesting that professional development plays a key role in adopting AI. On the other hand, demographic variables such as age, sex and civil status were not significantly associated with AI integration. There was no significant difference between the perceptions of teachers and school heads, indicating a common understanding of AI integration in education.

In general, the results suggest that AI is more recognised and moderately used in public elementary education, but its incorporation is still ongoing, being more influenced by professional exposure and training than by demographic features.

## CONCLUSIONS

These conclusions address each of the research questions derived from the major findings of the study and provide a synthesized understanding of the current state of artificial intelligence (AI) integration in public elementary schools.

Based on the findings, the researcher draws the following conclusion.

1. The teaching workforce in public elementary schools is largely composed of middle-aged, female, and married professionals. Most have pursued or are pursuing graduate studies and have extensive years of teaching experience. However, AI-related training, especially at the regional, national, and international levels, remains limited.
2. Teachers demonstrated a moderate level of awareness regarding AI, with relatively higher general awareness compared to specific knowledge of tools and institutional support systems.
3. AI tools are moderately used in the teaching process. While popular tools like ChatGPT and Grammarly are being utilized, a significant number of teachers remain non-users of AI tools.
4. Teachers moderately integrate AI into the teaching process. Integration is most evident in teaching resources and least evident in planning and management activities.
5. Ethical and societal concerns were rated as very serious, while technical, pedagogical, and readiness issues were rated moderately serious. This underscores key barriers to sustainable AI integration.
6. Teachers recognize the potential of AI to enhance learner engagement, improve assessment and feedback, and support their own professional growth and innovation.
7. AI integration is significantly associated with age, sex, education, years in service, and training frequency. Younger and more trained teachers tend to utilize AI tools more.
8. There is no significant difference between school heads and teachers in their perceptions of AI integration, indicating consensus and shared understanding.

## RECOMMENDATIONS

The following recommendations are formulated based on the conclusions drawn from the study. They aim to address the identified gaps, challenges, and opportunities in the integration of Artificial Intelligence (AI) in the teaching processes of public elementary schools. These proposals are intended to guide school leaders, policymakers, and educators in enhancing institutional support, capacity-building, and curriculum alignment with emerging educational technologies.

Based on the results of the study and the conclusions generated, the researcher recommends the following:

1. DepEd regional office may expand access to localized and globally aligned AI-related professional development programs. Training shall cater to varied career stages and promote continuous teacher upskilling aligned with AI integration demands. There is a need to enhance the awareness of the public elementary school teacher on the potentials of AIs in the teaching processes. DepEd may provide/conduct seminars and trainings on the use of AIs.
2. May implement awareness campaigns, institutional orientations, and LAC-based seminars to familiarize teachers with AI applications, ethical considerations, and DepEd's strategic directions for AI in basic education.
3. DepEd may conduct targeted hands-on training focused on functional applications of AI tools in pedagogy. Promote usage through instructional exemplars and peer coaching mechanisms.
4. DepEd shall embed AI-enhanced strategies in lesson planning guides and teaching portfolios. Encourage interdisciplinary collaboration to model AI-supported instructional planning and content delivery.

5. The most serious concern identified in the integration of AI in the teaching process is related to ethical and societal issues. It is therefore recommended that DepEd should prioritize the development of clear policies and guidelines on the responsible use of AI in classrooms. These may include protocols on data privacy, academic honesty, and the ethical use of generative tools. Training programs must incorporate AI ethics as a core component, ensuring that teachers are equipped to navigate issues such as bias, misinformation, and fairness in AI applications.

In addition, addressing technical challenges through improved ICT infrastructure and deploying school-based IT support is found essential. Teacher readiness can be strengthened by offering regular, practical AI training aligned with NEAP standards. Pedagogical concerns may be resolved by integrating AI in lesson planning and promoting action research. Resource availability shall also be improved through budget allocations and access to a DepEd-endorsed repository of AI tools. Together, these measures will ensure a safer, more ethical, and inclusive integration of AI in Philippine basic education.

6. DepEd shall integrate AI practices into innovation grants, performance-based incentives, and communities of practice. Support teacher-led AI innovations at the school level.

7. DepEd shall adopt differentiated training models that consider teachers' backgrounds especially teachers belonging to higher age bracket. Also it is recommended that younger teachers may mentor faculty members in need and school heads shall establish mentoring systems to encourage experience sharing and cross-generational capacity building.

8. School heads shall foster this alignment through collaborative instructional leadership, joint training participation, and shared planning sessions to further institutionalize AI integration strategies.

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## REFERENCES

- Agbong-Coates, I. J. (2024). ChatGPT integration significantly boosts personalized learning outcomes: A Philippine study. *International Journal of Educational Management and Development Studies*, 5(2), 165–186. <https://doi.org/10.53378/353067>
- Tecuci, G. (2012). Artificial intelligence. Wiley Interdisciplinary Reviews: Computational Statistics, 4. <https://doi.org/10.1002/wics.200>
- Haenlein, M., & Kaplan, A. (2019). A Brief History of Artificial Intelligence: On the Past, Present, and Future of Artificial Intelligence. *California Management Review*, 61, 14 - 5. <https://doi.org/10.1177/0008125619864925>
- Zawacki-Richter, O., Marín, V.I., Bond, M. et al. Systematic review of research on artificial intelligence applications in higher education – where are the educators?. *Int J Educ Technol High Educ* 16, 39 (2019). <https://doi.org/10.1186/s41239-019-0171-0>
- Kumar, G., Sharma, D., & Bhardwaj, B. (2024). Artificial Intelligence in Education. In Reference Module in Social Sciences. Elsevier. <https://doi.org/10.1016/B978-0-443-13701-3.00483-7>

- Alqahtani, N., & Wafula, Z. (2024). Artificial Intelligence Integration: Pedagogical Strategies and Policies at Leading Universities. *Innovative Higher Education*. <https://doi.org/10.1007/s10755-024-09749-x>.
- Bozkurt, A., Karadeniz, A., Baneres, D., Guerrero-Roldán, A. E., & Rodríguez, M. E. (2021). Artificial Intelligence and Reflections from Educational Landscape: A Review of AI Studies in Half a Century. *Sustainability*, 13(2), 800. <https://doi.org/10.3390/su13020800>
- Mortlock, R., & Lucas, C. (2024). Generative artificial intelligence (Gen-AI) in pharmacy education: Utilization and implications for academic integrity: A scoping review. *Exploratory Research in Clinical and Social Pharmacy*, 15. <https://doi.org/10.1016/j.rcsop.2024.100481>
- Department of Education. (2025, February 20). Retrieved from [https://www.deped.gov.ph/2025/02/20/deped-launches-ai-center-for-education/?utm\\_source=chatgpt.com](https://www.deped.gov.ph/2025/02/20/deped-launches-ai-center-for-education/?utm_source=chatgpt.com)
- Villarino, R. T. (2025). Artificial Intelligence (AI) integration in Rural Philippine Higher Education: Perspectives, challenges, and ethical considerations. *International Journal of Educational Research and Innovation*.
- Giray, L., De Silos, P. Y., Adornado, A., & Dizon, L. (2024). Use and impact of artificial intelligence in Philippine higher education: Reflections from instructors and administrators. *ResearchGate*. <https://www.researchgate.net/publication/381190498>
- Galindo-Domínguez, H., Delgado, N., Losada, D., & Etxabe, J. (2023). An analysis of the use of artificial intelligence in education in Spain: The in-service teacher's perspective. *Journal of Digital Learning in Teacher Education*, 40, 41 - 56. <https://doi.org/10.1080/21532974.2023.2284726>.