

# **Pedagogical Strategies for Artificial Intelligence Integration in Junior High Schools of Congressional District IV, Batangas Province**

Ladylyn R. Abante <sup>1</sup>

1 – Catmon Elementary School

[ladylyn.abante@deped.gov.ph](mailto:ladylyn.abante@deped.gov.ph) / 0009-0006-7291-5543

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## **Abstract**

Artificial Intelligence (AI) is transforming instructional practices globally, yet its integration in Philippine classrooms remains limited. This study investigated the extent of AI utilization in English instruction among Junior High School teachers in Congressional District IV, Batangas Province. It further examined teachers' awareness of students' AI use, the manifestation of students' critical thinking skills, and the challenges encountered in AI integration.

A quantitative research design was employed, involving 125 Junior High School teachers selected through purposive sampling. Data were collected using a researcher-developed questionnaire measuring AI utilization across instructional domains, teacher awareness, student skill development, and integration challenges. Descriptive statistics, including weighted mean, were used for analysis.

Teachers reported moderate use of AI in teaching, instructional material preparation, and student evaluation. Awareness of common AI tools and associated risks was high, although training in detecting AI-generated content was lacking. Students demonstrated moderate levels of problem-solving, creativity, and independent thinking. Major challenges included limited access to premium AI tools, insufficient training opportunities, and infrastructure gaps.

The findings highlight the urgent need for structured AI integration in Philippine education, particularly in English instruction. The proposed AI Integration Enhancement Program (AIIEP) offers practical strategies to promote ethical AI use, strengthen digital literacy, and foster critical thinking among students. These results provide a foundation for policy development, teacher training, and curriculum enhancement, ensuring that AI serves as a complement to, rather than a substitute for, meaningful learning experiences.

**Keywords:** *artificial intelligence (AI) integration, English instruction, critical thinking skills, teacher awareness, Philippine education*

### Introduction

Artificial Intelligence (AI) is reshaping education worldwide, offering opportunities for personalized learning, automated assessment, and enhanced instructional practices. Tools such as ChatGPT, Grammarly, and Canva are increasingly used by teachers and students, yet their adoption in Philippine classrooms remains limited. While ASEAN countries like Singapore and Malaysia have successfully integrated AI into language education, the Philippines faces challenges including digital inequality, insufficient training, and ethical concerns.

This study investigates the extent of AI utilization in English instruction among Junior High School teachers in Congressional District IV, Batangas Province. It explores teachers' awareness of students' AI use, the manifestation of critical thinking skills, and challenges in integration. The study also proposes enhancement activities to promote responsible AI use.

Specifically, it sought to answer the following questions:

1. What is the extent of utilization of AI in English instruction in terms of:
  - 1.1 teaching-learning process;
  - 1.2 preparation of instructional materials;
  - 1.3 use of instructional materials; and
  - 1.4 evaluation of student learning?
2. How may the degree of teachers' awareness on students' AI use be assessed with reference to:
  - 2.1 methods of detecting AI use;
  - 2.2 common AI tools utilized; and
  - 2.3 risks of improper use?
3. What is the extent of manifestation of students' learning and critical thinking skills in terms of:
  - 3.1 problem-solving abilities;
  - 3.2 creativity; and
  - 3.3 independent thinking?
4. What challenges do teachers encounter when integrating AI into the teaching-learning process?
5. Based on the findings, what enhancement activities may be proposed?

## Methodology

### Research Design

The study employed a quantitative descriptive research design to assess AI utilization, teacher awareness, student skill manifestation, and integration challenges. A researcher-made questionnaire was used to gather data.

### Participants

A total of 125 Junior High School teachers from Congressional District IV, Batangas Province were selected through purposive sampling. The sample represented diverse experiences and levels of familiarity with AI tools.

### Research Instrument

The questionnaire measured:

- Extent of AI utilization in instruction
- Teacher awareness of student AI use
- Manifestation of students' problem-solving, creativity, and independent thinking
- Challenges in AI integration

The instrument was validated by experts in education and technology integration.

### Data Collection Procedure

Data were collected through survey administration. Teachers responded to items on AI use in teaching, preparation, evaluation, and awareness. Responses were tabulated and analyzed using descriptive statistics.

### Data Analysis

Weighted mean and frequency distribution were used to interpret responses. Results were categorized into levels of utilization, awareness, and manifestation of skills. Challenges were summarized and enhancement activities proposed.

### Results

#### 1. Extent of AI Utilization

##### 1.1 Teaching and learning process

Based on the table, teachers moderately utilized AI in the teaching and learning process with a grand mean of 2.98. This indicated that teachers used AI occasionally in instruction but not to a great extent. This meant that some factors affected the limited use of AI. This may be attributed to a lack of training in AI integration.

**Extent of utilization of AI in English instruction as assessed by the teachers in terms the teaching learning process**

Teaching-learning process <i>As an English Teacher I...</i>	Mean	SD	Verbal Interpretation	Rank
1. use AI-powered tools during lessons	2.99	0.81	Moderately Utilized	4
2. utilize AI platforms to give varied tasks to diverse students	3.08	0.80	Moderately Utilized	1.5
3. employ AI to generate discussion prompts	2.96	0.92	Moderately Utilized	6
4. use AI-based speech pronunciation apps	2.83	0.98	Moderately Utilized	8
5. incorporate gamified exercises using AI	2.98	0.90	Moderately Utilized	5
6. scaffold higher-order thinking tasks through AI	3.04	0.84	Moderately Utilized	3
7. give enrichment activities through AI tools	3.08	0.78	Moderately Utilized	1.5
8. streamline lesson flow and time management through AI	2.89	0.91	Moderately Utilized	7
<b>Grand Mean</b>	<b>2.98</b>		<b>Moderately Utilized</b>	

Legend: 3.50-4.00 (Highly Utilized); 2.50-3.49 (Moderately Utilized); 1.50-2.49 (Slightly Utilized); 1.00-1.49 (Least Utilized)

## 1.2 Preparation of Instructional Materials

The table showed that the teachers moderately utilized AI in the preparation of instructional materials with a grand mean of 3.01. This indicated that the teachers have moderate skill in applying AI in the crafting of their instructional materials. Limited skills in using AI can prevent adoption of AI in the preparation of materials.

**Extent of utilization of AI in English instruction as assessed by the teachers in terms of Preparation of Instructional Materials**

Preparation of Instructional Materials <i>As an English Teacher I...</i>	Mean	SD	Verbal Interpretation	Rank
1. generate worksheets through AI	3.02	0.91	Moderately Utilized	4
2. craft materials of varied level for diverse learners	3.14	0.76	Moderately Utilized	2
3. develop graphic organizers through AI	2.98	0.94	Moderately Utilized	5
4. localize materials through AI	2.92	0.91	Moderately Utilized	6
5. summarize or even simplify texts with the help of AI	3.23	0.80	Moderately Utilized	1
6. generate homework based on students' level	3.10	0.86	Moderately Utilized	3
7. craft audio materials using AI	2.77	0.97	Moderately Utilized	8
8. produce visual materials through AI	2.90	0.98	Moderately Utilized	7
<b>Grand Mean</b>	<b>3.01</b>		<b>Moderately Utilized</b>	

Legend: 3.50-4.00 (Highly Utilized); 2.50-3.49 (Moderately Utilized); 1.50-2.49 (Slightly Utilized); 1.00-1.49 (Least Utilized)

### 1.3 Use of Instructional Materials

The table showed that the teachers moderately utilized AI in the use of instructional materials, with a grand mean of 2.88. This meant that teachers used AI in instruction, but to a certain extent only. This may be caused by several factors, such as the lack of awareness and limited exposure to AI tools. Teachers may also doubt the pedagogical validity of Page 76 materials generated from AI.

**Extent of utilization of AI in English instruction as assessed by the teachers in terms of the Use of Instructional Materials**

Use of Instructional Materials <i>As an English Teacher I use...</i>	Mean	SD	Verbal Interpretation	Rank
1. AI-created slides or visuals in delivery of lessons	2.92	1.00	Moderately Utilized	4
2. AI-generated reading materials in class.	3.02	0.88	Moderately Utilized	2
3. AI-based interactive tools to conduct activities	3.00	0.96	Moderately Utilized	3
4. AI-created worksheets in my teaching.	3.05	0.90	Moderately Utilized	1
5. AI to run online discussions or forums.	2.72	1.00	Moderately Utilized	7
6. AI-generated audio to play during listening activities.	2.71	1.02	Moderately Utilized	8
7. AI-based writing tools during lessons.	2.83	0.99	Moderately Utilized	5
8. AI tools in my learning management system to give instant feedback on quizzes.	2.81	0.95	Moderately Utilized	6
<b>Grand Mean</b>	<b>2.88</b>		<b>Moderately Utilized</b>	

Legend: 3.50-4.00 (Highly Utilized); 2.50-3.49 (Moderately Utilized); 1.50-2.49 (Slightly Utilized); 1.00-1.49 (Least Utilized)

### 1.4 Evaluation of Student Learning

Based on the table, the results revealed that the teachers moderately utilized AI in evaluating student learning with a grand mean of 2.76. This implied the limited use of AI in student assessment. This may be caused by the lack of internet access in schools where assessments are made. This prevented the teachers from using AI in such tasks.

**Extent of utilization of AI in English instruction as assessed by the teachers in terms of Evaluation of Student Learning**

Evaluation of Student Learning <i>As an English Teacher I...</i>	Mean	SD	Verbal Interpretation	Rank
1. check grammar and structure with the aid of AI	3.20	0.91	Moderately Utilized	1
2. grade essay responses using AI	2.62	1.05	Moderately Utilized	7
3. use automated feedbacking system of AI	2.63	1.07	Moderately Utilized	6
4. use AI analytics to monitor student progress	2.55	1.07	Moderately Utilized	5
5. track participation of students through AI	2.58	1.08	Moderately Utilized	8
6. predict learning gaps through AI	2.65	1.05	Moderately Utilized	4
7. check for plagiarism using AI tools	2.93	0.98	Moderately Utilized	2
8. analyze semantic errors through AI	2.91	0.96	Moderately Utilized	3
<b>Grand Mean</b>	<b>2.76</b>		<b>Moderately Utilized</b>	

Legend: 3.50-4.00 (Highly Utilized); 2.50-3.49 (Moderately Utilized); 1.50-2.49 (Slightly Utilized); 1.00-1.49 (Least Utilized)

## 2. Teacher Awareness

### 2.1 Methods of Detecting AI Use

In terms of methods of detecting AI use, teachers reported that they are moderately aware with a grand mean of 3.10. This meant that teachers had a limited idea of how to detect AI use. They often relied on traditional approaches in identifying whether the submitted output is AI generated. This may be attributed to the lack of training for teachers in detecting AI use in students' outputs.

**Degree of Awareness on AI use as assessed by the teachers in terms of Methods of Detecting AI use**

Methods of Detecting AI Use <i>As an English Teacher I...</i>	Mean	SD	Verbal Interpretation	Rank
1. use AI detection tools to identify machine-generated content in student outputs	2.97	0.95	Moderately Aware	8
2. compare with the previous students' work	3.03	0.96	Moderately Aware	7
3. check for style and content signals	3.05	0.94	Moderately Aware	6
4. ask students to explain their work	3.17	0.87	Moderately Aware	2.5
5. require drafts of outlines	3.11	0.81	Moderately Aware	4.5
6. include prompts that need personal reflection	3.11	0.88	Moderately Aware	4.5
7. cross-check knowledge by giving short quizzes or a write-up of the same topic	3.17	0.88	Moderately Aware	2.5
8. examine the inconsistency of the text structure	3.20	0.87	Moderately Aware	1
<b>Grand Mean</b>	<b>3.10</b>		<b>Moderately Aware</b>	

Legend: 3.50-4.00 (Highly Aware); 2.50-3.49 (Moderately Aware); 1.50-2.49 (Slightly Aware); 1.00-1.49 (Least Aware)

## 2.2 Common AI tools Utilized

The results revealed that the teachers were moderately aware of the common AI tools used by students, with a grand mean of 3.27. This meant that while teachers had moderate utilization of AI tools, they knew the tools used by the students. It implied that teachers are doing their best to be familiar with the interests of the students so that they can maximize their use in the future.

**Degree of Awareness on AI use as assessed by the teachers in terms of Common AI tools utilized**

Common AI Tools Utilized by Students <i>As an English Teacher, I am aware of...</i>	Mean	SD	Verbal Interpretation	Rank
1. Canva	3.71	0.60	Highly Aware	1
2. ChatGPT	3.70	0.59	Highly Aware	2
3. Grammarly	3.46	0.78	Moderately Aware	6
4. CoPilot	2.82	1.08	Moderately Aware	4
5. QuillBot	3.30	0.87	Moderately aware	3
6. Turnitin	2.66	1.07	Moderately Aware	5
<b>Grand Mean</b>	<b>3.27</b>		<b>Moderately Aware</b>	

Legend: 3.50-4.00 (Highly Aware); 2.50-3.49 (Moderately Aware); 1.50-2.49 (Slightly Aware); 1.00-1.49 (Least Aware)

## 2.3 Risks of Improper Use

The results revealed that the teachers were highly aware of the risks of improper use of AI, with a grand mean of 3.81. This indicated that teachers had an in-depth understanding of the risks of AI in education and how it may negatively impact the individual thinking of students. This may be because of the numerous discussions online wherein the ethical dilemma of using AI has been discussed.

**Degree of Awareness on AI use as assessed by the teachers in terms of Common AI tools utilized**

Risks of Improper Use <i>As an English Teacher I/am...</i>	Mean	SD	Verbal Interpretation	Rank
1. understand that some students will rely on AI to complete schoolwork.	3.80	0.44	Highly Aware	6.5
2. recognize that AI use may weaken students' critical thinking skills.	3.80	0.46	Highly Aware	6.5
3. mindful that AI can contribute to issues like plagiarism and academic dishonesty.	3.83	0.39	Highly Aware	1.5
4. realize that students might overuse AI instead of developing their learning skills.	3.83	0.42	Highly Aware	1.5
5. acknowledge that AI-generated responses may lack originality and deep understanding.	3.82	0.42	Highly Aware	3
6. know that excessive AI use could negatively impact students' writing development.	3.80	0.40	Highly Aware	5.5
7. see that AI may hinder students from forming independent thoughts and ideas.	3.81	0.43	Highly Aware	4
8. understand that AI-assisted work might not accurately reflect a student's real skills.	3.80	0.40	Highly Aware	6.5
<b>Grand Mean</b>	<b>3.81</b>		<b>Highly Aware</b>	

Legend: 3.50-4.00 (Highly Aware); 2.50-3.49 (Moderately Aware); 1.50-2.49 (Slightly Aware); 1.00-1.49 (Least Aware)

### 3. Student Critical Thinking Skills

#### 3.1 Problem-solving skills

The table showed that the teachers believed that problem-solving skills were moderately manifested by using AI in instruction, with a grand mean of 3.18. This implied that AI provides problem-solving scenarios that can help students maximize learning. However, the moderate result showed that learners mainly rely on direct answers from AI rather than using it to develop higher-order thinking skills. This may be because the use of AI was associated with being an information source rather than a tool for better learning.

**Manifestation of Students' Learning and Critical Thinking Skills in terms of Problem-solving skills**

Problem-solving Skills <i>As an English Teacher I think...</i>	Mean	SD	Verbal Interpretation	Rank
1. AI helps students break down complex questions into smaller, manageable parts.	3.31	0.78	Moderately Manifested	2
2. AI supports learners in finding different ways to solve language-related challenges.	3.36	0.78	Moderately Manifested	1
3. AI improves students' ability to think logically when answering reading and writing tasks.	3.07	0.94	Moderately Manifested	8
4. AI provides step-by-step guidance to help students solve problems on their own.	3.20	0.91	Moderately Manifested	3
5. AI encourages learners to explore multiple solutions before choosing the best one.	3.15	0.94	Moderately Manifested	4
6. AI helps students recognize mistakes in their answers and correct them independently.	3.11	0.93	Moderately Manifested	6.5
7. AI teaches students how to organize their thoughts before responding to difficult questions.	3.14	0.94	Moderately Manifested	5
8. AI helps students understand how to apply lessons to real-world situations.	3.11	0.91	Moderately Manifested	6.5
<b>Grand Mean</b>	<b>3.18</b>		<b>Moderately Manifested</b>	

Legend: 3.50-4.00 (Highly Manifested); 2.50-3.49 (Moderately Manifested); 1.50-2.49 (Slightly Manifested); 1.00-1.49 (Least Manifested)

#### 3.2 Students' Creativity

The table showed that the students' creativity was moderately manifested with a grand mean of 3.16. This meant that AI offered moderate enhancement in creativity. While there are several options provided by AI, students may not have the opportunity to generate their own ideas or infuse fresh ideas from generated ones because the answer was already presented to them. This may be because AI has a systematic approach to answering questions, which neglects creativity and originality.

**Manifestation of Students' Learning and Critical Thinking Skills in terms of Creativity**

<b>Students' Creativity</b> <i>As an English Teacher I think...</i>	<b>Mean</b>	<b>SD</b>	<b>Verbal Interpretation</b>	<b>Rank</b>
1. AI encourages students to generate fresh ideas for writing and discussions.	3.11	0.87	Moderately Manifested	7
2. AI helps learners explore different ways to express thoughts creatively.	3.14	0.82	Moderately Manifested	5.5
3. AI provides writing prompts that inspire originality in student work.	3.07	0.87	Moderately Manifested	8
4. AI assists students in brainstorming unique solutions to language tasks.	3.14	0.86	Moderately Manifested	5.5
5. AI supports learners in improving their storytelling and imaginative thinking.	3.19	0.79	Moderately Manifested	4
6. AI encourages students to experiment with new words and sentence structures.	3.20	0.83	Moderately Manifested	2.5
7. AI helps learners visualize their ideas through digital tools and resources.	3.23	0.81	Moderately Manifested	1
8. AI promotes artistic expression in language-related activities.	3.20	0.80	Moderately Manifested	2.5
<b>Grand Mean</b>	<b>3.16</b>		<b>Moderately Manifested</b>	

*Legend: 3.50-4.00 (Highly Manifested); 2.50-3.49 (Moderately Manifested); 1.50-2.49 (Slightly Manifested); 1.00-1.49 (Least Manifested)*

### 3.4 Independent Thinking

Teachers expressed that the students moderately manifested independent thinking because of AI use. This meant that the use of AI limits the opportunities to think independently. Overreliance on AI can affect the ability to direct oneself towards better learning. This may be because of the use of AI for direct answers rather than a tool for reflection and deep thinking.

**Manifestation of Students' Learning and Critical Thinking Skills in terms of Independent Thinking**

<b>Independent Thinking</b> <i>As an English Teacher, I think...</i>	<b>Mean</b>	<b>SD</b>	<b>Verbal Interpretation</b>	<b>Rank</b>
1. AI helps students think for themselves before seeking assistance.	2.97	0.91	Moderately Manifested	8
2. AI encourages learners to evaluate different viewpoints before forming their own ideas.	2.99	0.92	Moderately Manifested	7
3. AI provides examples that help students make independent choices in writing and discussions.	3.06	0.86	Moderately Manifested	2.5
4. AI helps students question and analyze information instead of just accepting it.	3.05	0.88	Moderately Manifested	4
5. AI promotes self-correction by allowing students to reflect on their own mistakes.	3.02	0.89	Moderately Manifested	5.5
6. AI gives learners opportunities to explore topics without relying too much on teachers.	3.13	0.82	Moderately Manifested	1
7. AI assists students in forming arguments and justifying their reasoning.	3.06	0.85	Moderately Manifested	2.5
8. AI helps students make decisions by comparing different sources of information.	3.02	0.90	Moderately Manifested	5.5
<b>Grand Mean</b>	<b>3.04</b>		<b>Moderately Manifested</b>	

*Legend: 3.50-4.00 (Highly Manifested); 2.50-3.49 (Moderately Manifested); 1.50-2.49 (Slightly Manifested); 1.00-1.49 (Least Manifested)*

#### 4. Challenges in Integration

The grand mean of 3.51 indicated that the teachers faced significant challenges in integrating AI in English instruction. This means that the teachers experience several barriers in using AI in teaching. This may be because of the lack of formal training on AI integration. The standard deviation ranged from 0.51 to 0.67, which showed low to moderate variability. This meant that in the aspect of challenges encountered by teachers in using AI, the teachers had almost the same responses.

**Challenges Encountered by Teachers in Integrating AI**

<b>Challenges</b>	<b>Mean</b>	<b>SD</b>	<b>Verbal Interpretation</b>	<b>Rank</b>
1. Limited training in AI integration	3.56	0.53	Strongly Agree	3
2. Limited internet access	3.34	0.67	Strongly Agree	8
3. Lack of devices for students	3.55	0.60	Strongly Agree	4
4. Time constraints	3.47	0.59	Strongly Agree	6
5. Lack of administrative support	3.42	0.62	Strongly Agree	7
6. Privacy and security concerns	3.60	0.55	Strongly Agree	2
7. Not having access to premium versions of AI tools	3.64	0.51	Strongly Agree	1
8. Mismatch between AI tools and learning preferences	3.54	0.57	Strongly Agree	5
<b>Grand Mean</b>	<b>3.51</b>		<b>Strongly Agree</b>	

*Legend: 3.50-4.00 (Strongly Agree); 2.50-3.49 (Agree); 1.50-2.49 (Disagree); 1.00-1.49 (Strongly Disagree)*



### 5. Proposed Enhancement Activities

The AI Integration Enhancement Program (AIIEP) was proposed, focusing on:

- Teacher training workshops
- Development of AI literacy modules
- Policies for ethical AI use
- Digital infrastructure support for schools

### Discussion

The findings highlight both opportunities and challenges in AI integration. Moderate utilization suggests that teachers recognize AI's potential but face barriers in training and resources. Awareness of risks underscores the need for structured policies and monitoring mechanisms. Students' moderate manifestation of critical thinking skills indicates that AI can support learning but must be balanced with strategies that foster independent thought.

These results align with global studies emphasizing the importance of digital literacy and ethical AI use. Compared to ASEAN peers, the Philippines requires stronger digital infrastructure and teacher capacity-building to maximize AI's benefits.

### Conclusion

This study demonstrated that AI integration in Junior High Schools of Batangas Province is at a moderate level, with teachers aware of its potential but constrained by challenges. Students benefit from AI in problem-solving and creativity, yet risks of misuse remain. The proposed AIIEP provides practical solutions to enhance responsible AI use, improve digital literacy, and foster critical thinking.

AI should be positioned as a supportive tool that complements, rather than replaces, meaningful learning experiences. Structured training, ethical guidelines, and infrastructure development are essential to ensure that AI integration strengthens education in the Philippines.

## References

### A. Books

- Cambridge University Press. (2025). Cambridge Dictionary Online. Cambridge: Cambridge University Press. Retrieved from <https://dictionary.cambridge.org>
- Mageswaran Sanmugan, Bosede L. Edwards, Nurul Maziah Mohd Barkhaya, Zuheir Khlaif (2025). *Fostering Inclusive Education with AI and Emerging Technologies*. IGI Global Scientific Publishing, USA.
- Naqvi A. (2020). *Artificial intelligence for audit, forensic accounting, and valuation: a strategic perspective*. Wiley.

### B. Unpublished Materials

- Alcayde, Mariel A. (2023). *Performance In Teaching Science Among Secondary Schools In Batangas City*. Unpublished Master's Thesis. Golden Gate Colleges
- Cueto, Ethel O. (2021). *Utilization of ICT-Based Instructional Materials Among Public Secondary Schools in the Division of Batangas City*. Unpublished Master's Thesis. Golden Gate Colleges
- F. Zhao, G. Z. Liu, J. Zhou, and C. Yin (2023). "A learning analytics framework based on human-centered artificial intelligence for identifying the optimal learning strategy to intervene in learning behavior," *Educational Technology & Society*, vol. 26, no. 1, pp. 132-146.
- Langreo, Lauraine (2025). *Education Week* <https://www.edweek.org/technology/artificial-intelligence>
- Magnaye, Janin Crizel E. (2020). *Utilization of Technology-based Learning Strategies for Science Instruction in Public Junior High Schools in Batangas City Division*. Unpublished Master's Thesis. Golden Gate Colleges
- M. M. T. Rodrigo et al. (2023). "The great challenges and opportunities of the next 20 years," *Handbook of Artificial Intelligence in Education*, pp. 606-649. <https://doi.org/10.4337/9781800375413.00040>
- M. Rieckmann (2021). *Education for Sustainable Development Goals: Learning Objectives*, Paris, PAR, France: UNESCO, pp:6-11.
- Villapando, Edna M. (2020). *Utilization of Instructional Materials in*

Teaching Grade 10 Science in The Division of Batangas City. Unpublished Master's Thesis. Golden Gate Colleges

### C. Journals, Magazines, and Periodicals

Abdelaal, N. M., & Al Sawi, I. (2024). Perceptions, Challenges, and Prospects: University Professors' Use of Artificial Intelligence in Education. *Australian Journal of Applied Linguistics*, 7(1), n1.

AlKanaan, H. M. N. (2022). Awareness regarding the implication of artificial intelligence in science education among pre-service science teachers. *International Journal of Instruction*, 15(3), 895–912.

Alwaqdani, M. Investigating teachers' perceptions of artificial intelligence tools in education: potential and difficulties. *Educ Inf Technol* 30, 2737–2755 (2025). <https://doi.org/10.1007/s10639-024-12903-9>

Bancoro, Jaysone Christopher M. (2024). The Relationship Between Artificial Intelligence (AI) Usage and Academic Performance of Business Administration Students. February 2024. *International Journal of Asian Business and Management* 3(1):27-48. DOI: 10.55927/ijabm.v3i1.7876

Barajas, J. R. B., Sangil, M. J. G., Aspra, N. O., Gealone, P. J., Lucero, A. T., Padua, O. M., & Oropesa, R. (2024). Exploratory data analysis of artificial intelligence integration in Philippine engineering programs offered by state universities and colleges: A preliminary assessment. In *IEEE Systems and Information Engineering Design Symposium (SIEDS)* (pp. 1-6). IEEE. <https://doi.org/10.1109/sieds61124.2024.10534634>

Biswas, S. (2023). Role of ChatGPT in Education (SSRN Scholarly Paper No. 4369981).

Cacho, R. (2024). Integrating Generative AI in University Teaching and Learning: A Model for Balanced Guidelines, *Online Learning*, Volume 28(3), (55-81). DOI: 10.24059/olj.v28i3.4508

Cano, C. A. G., & Troya, A. L. C. (2023). Artificial Intelligence applied to teaching and learning processes. *LatIA*, (1), 2.

Chavez, J. V. (2023). Assessing online academic integrity and humanized teaching in Zamboanga Peninsula Polytechnic State University. *Journal of Multidisciplinary in Social Sciences*, 19(1), 9-17.

Chavez, J., & Lamorinas, D. D. (2023). Reconfiguring assessment

- practices and strategies in online education during the pandemic. *International Journal of Assessment Tools in Education*, 10(1), 160-174.
- Chiu, T. K. F., Meng, H., Chai, C.-S., King, I., Wong, S., & Yam, Y. (2022). Creation and evaluation of a pre-tertiary artificial intelligence (AI) curriculum. *IEEE Transactions on Education*, 65(1), 30–39.
- Dalan, John Den Saul (2024.). Exploring-the-Promise-A-Comprehensive-Review of Artificial Intelligence Integration in Language Education in the Philippine Context. March 2024. Institutional Multidisciplinary Research and Development Journal IMRaD Journal Vol. 1 July 2023 ISSN 2619-7820 Columban College Asinan, Olongapo City. DOI: 10.13140/RG.2.2.27224.51201
- De Jesus, D. A. (2023). Enhancement Of Teacher Efficiency Through The Utilization Of Chatgpt: A Qualitative Case Study. *Ignatian International Journal For Multidisciplinary Research*, 1(2), 148-160.
- Duhaylungsod, A. V., & Chavez, J. V. (2023). ChatGPT and other AI users: Innovative and creative utilitarian value and mindset shift. *Journal of Namibian Studies*, 33, 4367-4378.
- E. Vázquez-Cano, S. Mengual-Andrés, E. López-Meneses. (2021). Chatbot to improve learning punctuation in Spanish and to enhance open and flexible learning environments. *International Journal of Educational Technology in Higher Education*, 18 (2021), pp. 1-20, 10.1186/s41239-021-00269-8
- Estrellado, C. J. P., & Miranda, J. C. (2023). Artificial intelligence in the Philippine educational context: Circumspection and future inquiries. *International Journal of Scientific and Research Publications*, 13(5), 704-715. <https://doi.org/10.29322/ijsrp.13.05.2023.p13704>
- Ferikoğlu, D., & Akgün, E. (2022). An Investigation of Teachers' Artificial Intelligence Awareness: A Scale Development Study. *Malaysian Online Journal of Educational Technology*. <https://doi.org/10.52380/mojet.2022.10.3.407>
- Fitria, Tira Nur (2021). Artificial Intelligence (AI) In Education: Using AI Tools for Teaching and Learning Process. Conference: Prosiding Seminar Nasional & Call for Paper STIE AAS. Surakarta, Jawa Tengah
- Haluza, D. & Jungwirth, D. (2023). Artificial intelligence and ten societal megatrends: An exploratory study using GPT-3. *Systems*, 11, 120
- H. Zhang, X. Han. (2021). Influence of vocalized reading practice on

- English learning and psychological problems of middle school students. *Frontiers in Psychology*, 12, Article 709023, 10.3389/fpsyg.2021.709023
- I. Celik. (2023). "Towards intelligent-TPACK: An empirical study on teachers' professional knowledge to ethically integrate Artificial Intelligence (AI)-based tools into education", *Computers in Human Behavior*, vol. 138, no. 107468, 2023. doi:10.1016/j.chb.2022.107468
- Inoferio, H. V., Espartero, M., Asiri, M., Damin, M., & Chavez, J. V. (2024). Coping with math anxiety and lack of confidence through AI-assisted Learning. *Environment and Social Psychology*, 9(5).
- Javier, D. R. C., & Moorhouse, B. L. (2023). Developing secondary school English language learners' productive and critical use of ChatGPT. *TESOL Journal*, e755.
- J.Q. Pérez, T. Daradoumis, J.M.M. Puig. (2020). Rediscovering the use of chatbots in education: A systematic literature review. *Computer Applications in Engineering Education*, 28. pp. 1549-1565, 10.1002/cae.22326
- Kaplan-Rakowski, R., Grotewold, K., Hartwick, P., & Papin, K. (2023). Generative AI and teachers' perspectives on education. *Journal of Research*, 34(2), 313-338. implementation Interactive in Learning
- Karakose, T., Demirkol, M., Aslan, N., Kose, H., & Yirci, R. (2023). A Conversation with ChatGPT about the Impact of the COVID-19 Pandemic on Education: Comparative Review Based on Human-AI Collaboration. *Educational Process International Journal*, 12(3).
- Kim, N. J., & Kim, M. K. (2022). Teacher's Perceptions of Using an Artificial Intelligence-Based Educational Tool for Scientific Writing. *Frontiers in Education*, 7
- Kohnke, L., Moorhouse, B. L., & Zou, D. (2023). Exploring generative artificial intelligence preparedness among university language instructors: A case study. *Computers & Education: Artificial Intelligence*, 5, 100156. Doi: 10.1016/j.caeai.2023.100156
- Kudzayi Savious Tarisayi (2024). A Theoretical Framework for Interrogating the Integration of Artificial Intelligence in Education. *Research on Education and Media* 16(1):38-44. DOI: 10.2478/rem-2024-0006
- López, F. A. (2021). Multilingual education in the Philippines: Historical development and current trends. *Language and Education*, 35(3), 247–263. <https://doi.org/10.1080/09500782.2020.1852623>

- López, L. J., & Perez, J. G. (2020). Artificial intelligence in language learning: Benefits and challenges. *Revista Científica*, 3(2), 58–70. <https://doi.org/10.29394/RC.2020.03.02.5>
- Mehdaoui, A. (2024). Unveiling Barriers and Challenges of AI Technology Integration in Education: Assessing Teachers' Perceptions, Readiness and Anticipated Resistance. *Futurity Education*, 4(4), 95-108.
- Ng, D. T. K., Leung, J. K. L., Su, J., Ng, R. C. W., & Chu, S. K. W. (2023). Teachers' AI digital competencies and twenty-first century skills in the post-pandemic world. *Educational Technology Research and Development*, 71(1), 137–161.
- Padilla, J. R. C., Montefalcon, M. D. L., & Hernandez, A. A. (2023, December). Language AI in Programming: A Case Study of ChatGPT in Higher Education Using Natural Language Processing. In 2023 IEEE 11th Conference on Systems, Process & Control (ICSPC) (pp. 276-281). IEEE.
- Polak, S., Schiavo, G., & Zancanaro, M. (2022). Teachers' perspective on artificial intelligence education: An initial investigation. *Proceedings of the 2022 ACM Conference on Innovation and Technology in Computer Science Education V.1*, 349–35
- Polak, S., Schiavo, G., & Zancanaro, M. (2022). Teachers' Perspective on Artificial Intelligence Education: an Initial Investigation. *CHI Conference on Human Factors in Computing Systems Extended Abstracts*
- Resti Tito H. Villarino. (2024). Artificial Intelligence (AI) integration in Rural Philippine Higher Education: Perspectives, challenges, and ethical considerations 2024 Local Research Ethics Committee, Cebu Technological University, Moalboal, Cebu, Philippines Medical Sciences Division, National Research Council of the Philippines, Manila, Philippines <https://orcid.org/0000-0002-5752-1742>
- Robinos, J.R., Binhamza, M.H., Casyao, I.M., Combis, H., Melgar, S.M., Sora, L., Austria, M.G. (2024). Examining attitudes and perceived usefulness of AI integration in teaching and learning processes. *Journal of Interdisciplinary Perspectives*, 2(12), 619-626. <https://doi.org/10.69569/jip.2024.0591>
- Robledo, D. A. R., Zara, C. G., Montalbo, S. M., Gayeta, N. E., Gonzales, A. L., Escarez, M. G. A., & Maalihan, E. D. (2023). Development and Validation of a Survey Instrument on Knowledge, Attitude, and Practices (KAP) Regarding the Educational Use of ChatGPT among Preservice Teachers in the Philippines. *International Journal of Information and Education Technology*, 13(10).

- Sallam, M., Salim, N. A., Barakat, M., Al-Mahzoum, K., Ala'a, B., Malaeb, D., ... & Hallit, S. (2023). Assessing health students' attitudes and usage of ChatGPT in Jordan: validation study. *JMIR medical education*, 9(1), e48254.
- Taeihagh, A. (2021). Governance of artificial intelligence. *Policy and Society*, 40(2), 137157. <https://doi.org/10.1080/14494035.2021.1928377>
- Tashtoush, M. A., Wardat, Y., Ali, R. A., & Saleh, S. (2024). Artificial intelligence in education: mathematics teachers' perspectives, practices and challenges. *Iraqi Journal for Computer Science and Mathematics*, 5(1), 20.
- TESDA (Technological Education and Skills Development Authority). (2021). *The Potential of AI: Divergent Possibilities of Innovation*.
- Villaceran, R., Rioflorido, J., & Paguiligan, D. (2024). Initial development and validation of a questionnaire for students' artificial intelligence knowledge in education. *Cognizance Journal*, 4(5), 3-15. <https://doi.org/10.47760/cognizance.2024.v04i05.003>
- W. Holmes, M. Bialik and C. Fadel. (2023). "Artificial Intelligence in education", *Data Ethics: Building Trust: How Digital Technologies Can Serve Humanity*, pp. 621-653, 2023. doi:10.58863/20.500.12424/4276068
- Yang, S. J., Lin, C. C., Huang, A. Y., Lu, O. H., Hou, C. C., & Ogata, H. (2023). AI and big data in education: learning patterns identification and intervention leads to performance enhancement. *Information and Technology in Education and Learning*, 3(1), Inv-p002.

#### **D. Legal Documents**

- DepEd Order No. 36, Series 2013. *Our Department of Education Vision, Mission and Core Values (DepEd VMV)*
- DepEd Order No. 43, Series 2013. *Implementing Rules and Regulations (IRR) of Republic Act No. 10533, Otherwise Known as the Enhanced Basic Education Act of 2013*
- DepEd Order No. 42, Series 2017. *National Adoption and Implementation of the Philippine Professional Standards for Teachers*

#### **E. Electronic Sources**

- Aljemely, Y. (2024, October). Challenges and best practices in training teachers to utilize artificial intelligence: A systematic review. In *Frontiers in Education* (Vol. 9, p. 1470853). Frontiers Media SA.

- Bulawan AA, Tilos FG, Bulawan A, Samonte J, Alejo K, Carasicas M. (2023). The Lived Experiences of Students in Learning with Technology in Noveleta Senior High School: A Descriptive Phenomenological Research Study. *International Journal of Advanced Multidisciplinary Research and Studies*. 2023; 3(4):438-441. <https://www.multiresearchjournal.com/arclist/list2023.3.4/id-1445>
- Chiu, T. K. F., & Chai, C. (2020). Sustainable curriculum planning for Artificial intelligence education: A self-determination theory perspective. *Sustainability*, 12(14), 5568. <https://doi.org/10.3390/su12145568>
- Fissore, C., Floris, F., Conte, M. M., & Sacchet, M. (2024, March). Teacher training on artificial intelligence in education. In *Smart Learning Environments in the Post Pandemic Era: Selected Papers from the CELDA 2022 Conference* (pp. 227-244). Cham: Springer Nature Switzerland.
- Huraj, L., Pospíchal, J., & Luptáková, I. D. (2023, October). Learning enhancement with AI: From idea to implementation. In *2023 21st International Conference on Emerging eLearning Technologies and Applications (ICETA)* (pp. 212-219). IEEE.
- Jam, S., & Alam, M. A. (2020). Comparative Study of Artificial Intelligence-Based Teaching With Human Interactive Teaching: In E. C. Idemudia (Ed.), *Advances in Business Strategy and Competitive Advantage* (pp. 68–100). IGI Global. <https://doi.org/10.4018/978-1-7998-3351-2.ch005>
- Kaledio, P., Robert, A., & Frank, L. (2024). The Impact of Artificial Intelligence on Students' Learning Experience. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.4716747>
- Karimi, H., & Khawaja, S. (2023). The Impact of Artificial Intelligence on Higher Education in England. *Creative Education*, 14(12). <https://doi.org/10.4236/ce.2023.1412154>
- Klamma, R., Lange, P. de, Neumann, A. T., Hensen, B., Kravcik, M., Wang, X., & Kuzilek, J. (2020). Scaling Mentoring Support with Distributed Artificial Intelligence. *Intelligent Tutoring Systems*, 38–44. [https://doi.org/10.1007/978-3-030-49663-0\\_6](https://doi.org/10.1007/978-3-030-49663-0_6)
- Philippine News Agency (PNA). (2021). Smart campus rises in Ilocos Norte. [https://www.pna.gov.ph/articles/1144817\[33\]](https://www.pna.gov.ph/articles/1144817[33])
- PIA (2021, July 25). UNP adopts smart campus concept; receives P25M

- CHED grant.. [https://pia.gov.ph/news/2021/07/25/unp-adopts-smart-campus-concept-receives-p25m-ched-grant\[32\]](https://pia.gov.ph/news/2021/07/25/unp-adopts-smart-campus-concept-receives-p25m-ched-grant[32])
- Rahman, M. M., & Watanobe, Y. (2023). ChatGPT for Education and Research: Opportunities, Threats, and Strategies. *Applied Sciences(Switzerland)*,13(9).<https://doi.org/10.3390/app13095783>
- Seldon, Anthony Luckin, Rose, Lakhani Priya, Clement-Jones, OBE L. T. (2020). The Institute for Ethical AI in Education. Interim report: Towards a shared vision of ethical AI in education. <https://www.buckingham.ac.uk/wp-content/uploads/2020/02/The-Institute-for-Ethical-AI-in-Educations-Interim-Report-Towards-a-Shared-Vision-of-Ethical-AI-in-Education.pdf>. (2020)
- Thornhill-Miller, B., Camarda, A., Mercier, M., Burkhardt, J. M., Morisseau, T., Bourgeois-Bougrine, S., Vinchon, F., El Hayek, S., Augereau-Landais, M., Mourey, F., Feybesse, C., Sundquist, D., & Lubart, T. (2023). Creativity, Critical Thinking, Communication, and Collaboration: Assessment, Certification, and Promotion of 21st Century Skills for the Future of Work and Education. In the *Journal of Intelligence*. (Vol.11, Issue 3). <https://doi.org/10.3390/jintelligence11030054>
- Van den Berg, G., & du Plessis, E. (2023). ChatGPT and Generative AI: Possibilities for Its Contribution to Lesson Planning, Critical Thinking and Openness in Teacher Education. *Education Sciences*, 13(10). <https://doi.org/10.3390/educsci13100998>
- Wells, R.E. (2023). Strong AI vs. weak AI: What's the difference? Strong AI can do anything a human can do, while weak AI is limited to a specific task. *LifeWire*. Retrieved August 22, 2023, from <https://www.lifewire.com/strong-ai-vs-weak-ai-7508012>.
- Walter, Y. (2024). Embracing the future of Artificial Intelligence in the classroom: the relevance of AI literacy, prompt engineering, and critical thinking in modern education. *International Journal of Educational Technology in Higher Education*, 21(1). <https://doi.org/10.1186/s41239-024-00448-3>
- Zhao, Y., Liu, Y., & Wu, H. (2024). Relationships among critical thinking disposition components of Chinese undergraduates: A moderated mediating effect analysis. *International Journal of Educational Research*,124. <https://doi.org/10.1016/j.ijer.2023.102306>