Blockchain, Artificial Intelligence, and Future Research

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BLOCKCHAIN, ARTIFICIAL INTELLIGENCE, AND FUTURE RESEARCH

ISSN: 3089-6975

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**To cite this article**. A. R. C. Gurion, D. E. V. Mateo, R. A. Ganiban, and J. A. Villarama, "Artificial Intelligence Integration in Pedagogy and Its Influence on Learning Styles," *Blockchain, Artif. Intell. Futur. Res.*, vol. 1, no. 2, pp. 70–83, 2025.
**DOI**: https://doi.org/10.70211/bafr.v1i2.216

OPEN ACCESS

https://doi.org/10.70211/bafr.v1i2.216

Blockchain, Artificial Intelligence, and Future Research Vol 1 No 2 (2025)

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Research Article

# Artificial Intelligence Integration in Pedagogy and Its Influence on Learning Styles

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| Received: 15 March 2025 | Revised: 30 April 2025 | Accepted: 4 June 2025 | Online: 15 June 2025 |
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**Abstract**

The rapid integration of Artificial Intelligence (AI) into education has transformed pedagogical strategies and academic approaches of learners. In response to this emerging trend, this study investigated how AI tools are used in teaching at Central Luzon State University Laboratory for Teaching and Learning-University Science High School (CLTL-USHS) and their impacts on students' learning styles. Employing a phenomenological qualitative research design, hybrid semi-structured interviews were conducted with four teachers and eight Senior High School students over a period of three weeks, with CLSU ethics approval. Findings indicated that teachers frequently use AI tools for plagiarism checking, content generation, lesson planning, and promoting interactive learning, while students perceived AI-supported learning as more personalized, efficient, and engaging, but also recognized challenges such as overdependence, less teacher-student interaction, and concerns about content validity. Through thematic analysis, six main themes with an emphasis of the supportive and challenging function of AI in traditional pedagogy were identified. These findings reflect that while AI tools provide many advantages in forming adaptive learning environments, cautious guidelines should be established to keep educational propriety and human touch in classrooms. The study recommends more teacher training, the development of AI literacy, and ethical guidelines for the responsible use of AI in education.

**Keywords:** Artificial Intelligence; Pedagogy; Learning Styles; Teachers; Students.

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## INTRODUCTION

In the context of technological modernization in teaching, various tools such as ChatGPT, Meta AI, and DeepSeek have emerged to provide educational services whether to assist teachers in crafting their lesson plans or helping students gain insights into doing their homework instantly. Artificial Intelligence (AI) has become an important factor in the integration of technology in the field of academics. As part of keeping up the fast-paced globalization, teaching strategies adapt to the current trends to ensure that the learners' education is progressively growing in response to societal demands.

The integration of AI in teaching and learning has been continuously studied in the past years. Primarily, learning platforms and tools propelled by AI algorithms are current leading trends in education [1]. However, as AI becomes a "transformative force" in shaping educational practices [2], working along with this technology implies ethical and evaluative challenges [3]. Although teachers are enthusiastic to explore innovative technologies [4], some factors affect their adoption of AI-integrated tools [5]. These agents are driven by AI information credibility as well as educational support coming from institutions. Similarly, teachers must enhance their AI literacy in attaining the knowledge and skills required to guide students [6]. Further, AI tools [7] are effective in cultivating teachers toward professional development. On the other hand, integrating AI in designing education curricula is an act of preparing students for an "uncertain, technology-driven future" [8]. As integrating AI into education becomes a "promising avenue" for learning experiences [9], negative impacts on students' academic and real-life performance may also occur [10]. AI dependence hinders the enrichment of students' critical thinking skills and limits their interaction with their teachers. As emphasized, it is essential to understand the diverse "dimensions" of AI integration in educational approaches to ensure students' preparedness for a technologically modernized future [11]. In addition, there is a need to implement ethical guidelines [12] for the use of AI in education. Instructors should not overlook students' interactional behavior within the AI-integrated environment [13]. Despite the fact that AI enhances student learning experiences [14], educators must transform their teaching strategies to keep up the continuous progress of AI [15], [16].

While there are previous studies in this respect, there remain a gap in determining how AI-integrated tools are being utilized in teaching and how they impact students' learning approaches. It is in this regard that this research explores the integration of AI in pedagogy particularly the specific strategies teachers use and how these trends diverge by context and subject area. This study paper intends to serve as a textual framework to formulate effective measures in using AI for comprehensive learning in benefitting teachers, learners, and institutions. Moreover, this research delves into the ethical challenges of using AI toward fostering academic integrity to teachers and students. As global education becomes more digitally advanced, this qualitative investigation ascertains the factors that must be considered to properly utilize and integrate AI in education.

## METHODS

### *Research Design*

A phenomenological qualitative approach was applied in this study to understand how the integration of AI in pedagogy influences the learning styles of students. Phenomenology as a qualitative approach is focused on exploring individuals' lived experience to understand the essence

of a phenomenon [17]. This approach aimed to uncover the AI-integrated pedagogical trends used by educators and to examine its influence on students' learning styles through a series of hybrid semi-structured interviews with the selected participants.

### *Context, Participants, and Sampling*

The study was conducted at Central Luzon State University Laboratory for Teaching and Learning-University Science High School (CLTL-USHS) in Science City of Muñoz, Nueva Ecija, Philippines. Twelve participated considering the suggested sample size [18] and data saturation for phenomenological research. "Purposive sampling" [19] was used to select four (4) CLTL-USHS teachers and eight (8) CLTL-USHS Senior High School (SHS) students who are AI users.

### *Research Instrument*

The interview guide as instrument was composed of ten (10) researcher-made open-ended questions validated by three experts who are social science researcher, language teacher, and psychologist. The instrument was composed of three components: (1) informed consent form and data privacy clause; (2) questions regarding AI in teaching; and (3) questions on AI's influence on learning style. The participants were fully informed and made sure to have their hybrid semi-structured interviews documented through written and audio recordings.

### *Data Collection Procedure*

Throughout the three-week duration allotted for hybrid semi-structured interviews with 12 selected participants, "open-ended questions" [20] enabled for further answers from them. "Data triangulation" [21] was observed to verify the accuracy of data through (a) inter-researcher verification, (b) ethics committee review, and (c) select participants' validation. All procedures were conducted in accordance to the protocols set by the Central Luzon State University (CLSU) Ethics Research Community (ERC).

### *Data Analysis Procedure*

Data analyses followed a "six-step systematic assessment" [22], as outlined in Figure 1. Data were structured and interpreted thematically, reflecting from all the information gathered. The process began with familiarization of data before coding. The next step was coding or labelling important segments to identify recurring patterns. The coded data were arranged into themes, which were thoroughly compared before discussing them.

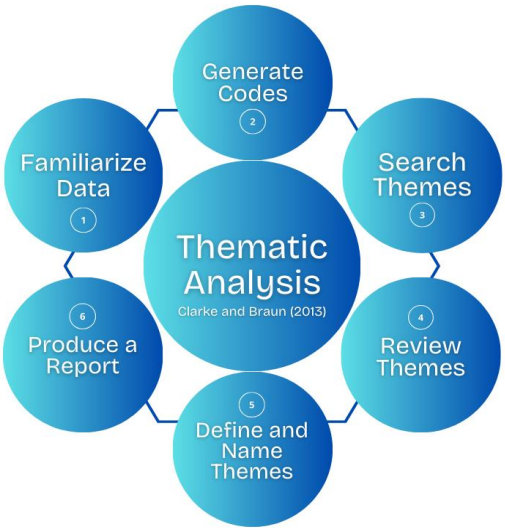


**Figure 1**. Adapted data analysis procedures

## RESULTS AND DISCUSSION

Figure 2 in this section shows the findings with major themes and subthemes on determining the AI-integrated pedagogical trends used by teachers in their classrooms and the positive and negative influences on learning styles.


**Figure 2.** Main Themes and Subthemes

### AI-Integrated Pedagogical Trends Used by Teachers in Their Classrooms

AI tools play important roles in making teaching more interactive, creative, and effective towards learners inside the classroom in the age of technological modernization. Teachers as well as student-

respondents emphasized several AI tools along with their corresponding purpose in the teaching process.

### *Plagiarism Checking, Language, and Writing Support*

AI tools have been widely used in the field of education to verify and validate the academic integrity of students as well as to improve their writing and language skills. Common AI plagiarism checkers and writing support tools such as Turnitin, Grammarly, and Quillbot assist both students and teachers to foster academic honesty. Students and teacher-respondents emphasized the importance of these AI-integrated software in learning and their benefits to academic writing.

*"Our teachers commonly use plagiarism checkers, like Grammarly, which also improves our writing skills. However, for instance, Turnitin is mostly used to check the originality of our work."* [SR3, Week 1, In-person Interview]

*"I know for a fact that they use Turnitin to uphold ethical standards and limit plagiarism."* [SR5, Week 1, In-person Interview]

*"I really make a lot of grammar mistakes when it comes to English writing so I will run it through Quillbot first."* [TR3, Week 2, Online Interview]

Similarly, ChatGPT, a common AI tool used as a writing assistant, can greatly enhance students' language skills and create a positive environment in their classrooms [23]. This indicates the potential of using AI in enhancing students' writing capabilities in accordance with their learning styles [24].

### *Lesson Planning and Content Generation*

AI tools support teacher development and encourage innovation in instructional practices. Platforms such as ChatGPT, Microsoft Copilot, NoteGPT, and Gemini (Google AI) were frequently used by educators to enhance the quality and efficiency of lesson planning. Teacher-respondents highlighted the convenience of using AI tools to create structured contents to make lesson preparation faster and more engaging for students.

*"Gemini and ChatGPT help me in developing lesson plans."* [TR2, Week 2, Online Interview]

*"I have a Microsoft license, so I use Copilot. I also use ChatGPT to develop the lessons for my students."* [TR4, Week 3, Online Interview]

*"I use ChatGPT and NoteGpt for my lessons."* [TR3, Week 2, Online Interview]

AI tools play an important role in helping teachers improve and develop professionally [7]. AI-powered platforms provide adaptive materials that allow teachers to better match their lesson plans to students' individual needs [25]. This shows that AI supports not only lesson preparation but also encourages teachers to create new and innovative ways of teaching.

### *Interactive and Engaging Teaching*

The use of AI-powered platforms such as Canva, Kahoot, and Google Meet has transformed classroom settings into more interactive, engaging, and accessible to students. These tools have made it possible for teachers to create artistic presentations and conduct quizzes and games that increase learner participation and enhance classroom engagement. Both teachers and students highlighted the benefits of AI in enhancing interactive and engaging teaching.

*"I've encountered a few teachers interested in integrating Kahoot or similar apps in our class. I believe they use AI to enhance interactive learning."* [SR5, Week 1, In-person Interview]

*"They use Google Meet and Kahoot to interact with us."* [SR8, Week 3, Online Interview]

*"I use Canva to make my lesson presentations more engaging and interactive to them."* [TR4, Week 3, Online Interview]

AI-enhanced interactivity helps sustain student interest through real-time, dynamic instruction [26]. This indicates that the use of AI boosts interactive teaching within the classroom setting.

## Factors Influencing AI Utilization in Pedagogy

Several factors were found influencing AI utilization in teaching. These include accessibility and ease of use, peer influence, and the need for technological modernization in teaching. Teachers pointed out some practical benefits of AI including reducing pedagogical workloads.

### *Accessibility and Ease of Use*

AI tools are mainly utilized because of their accessibility to the public. Findings indicate that teachers were more engaged in AI integration because of its capabilities in lessening workloads and generating educational contents.

*"With AI, you can get information in an instant. The long hours you would normally spend, for example, on research would shorten. AI will provide you with many ideas and information."* [TR4, Week 3, Online Interview]

In a similar study, AI use is positively perceived by educators as it has the potential to enhance motivation among learners, simplify teachers' tasks, and support classroom engagement [27].

### *Peer Influence*

Another factor of integrating AI into pedagogy is peer influence. Some teachers stated that utilizing AI was recommended by their fellow to increase work productivity and efficiency.

*"It was recommended by one of my research colleagues that I should utilize AI in checking my students' papers and research proposals."* [TR3, Week 2, Online Interview]

Peer influence plays a crucial role in AI adoption as educators often turn to their professional communities for recommendations and validation of teaching innovations [28]. Teachers are more

likely to integrate AI tools when they witness successful applications among colleagues or within shared teaching environments [1].

### *Technological Modernization*

Modernizing teaching strategies is key to enhancing educational systems. Instructors highlighted the benefits of incorporating AI into teaching to make the learning of students progressive and engaging.

*"So, we live in the 21st century, and technology is there to help us. So why not use it?"* [TR1, Week 2, Online Interview]

*"As we live in a technological age, it is important to use technology to improve how we present materials and lessons to students, while also enhancing their learning experience."* [TR2, Week 2, Online Interview]

Educators acknowledge the importance of using AI to create a more dynamic learning environment that meets students' needs, especially that these tools can improve engagement and the delivery of lessons [15], [29], [30].

## Assessing AI-supported Teaching on Learning Outcomes

Educators emphasized the need to check how AI impact students' learning through regular assessments. Teachers use written quizzes, tests, questions, and performance observations to determine if AI helps or hinders student understanding and skill development.

*"I mainly observe if they will grasp the explanations better when it is AI-generated or from the textbook; we can compare if they understand better."* [TR3, Week 2, Online Interview]

*"The first assessment we have is the summative assessment, followed by the formative. I also use such tool in exams."* [TR2, Week 2, Online Interview]

Although AI can be a "promising avenue" to reshape learning, it must be evaluated through consistent assessment practices [9]. There is also a need for alignment between AI tools and pedagogical objectives to ensure authentic learning outcomes [31].

## Positive Influences of AI on Students' Learning Styles

Positive insights about the benefits of AI-supported instruction were identified. Student-respondents shared that using AI has given them more efficient and personalized learning, which helps them understand lessons better.

### *Personalized, Interactive, and Engaging Learning*

AI has made learning more personalized and interactive. Students stated that the AI tools their teachers used helped them learn at their own pace, dive deeper into topics, and engage with content in ways that fit their learning styles.

*"AI tools make my learning more interactive and personalized. AI allows me study at my own pace unlike with traditional methods where the process can be slower."* [SR1, Week 1, In-person Interview]

*"I believe AI tools change how I learn by making it easier, more personalized, and interactive. Unlike traditional methods where I have to adjust to when or what I'll learn, AI makes it more engaging and interactive."* [SR3, Week 1, In-person Interview]

AI tools help improve learning by adjusting content to fit different student preferences, which makes learning more personalized and interactive [32]. Moreover, AI increases student engagement and makes learning more effective through personalized feedback and flexible methods [33]. These findings show that AI helps create meaningful interactions between students and their lessons.

### *Simplification of Concepts*

One of the key strengths of AI tools is that they can make challenging topics easier to understand by summarizing, translating, and breaking things down step by step. Students shared that AI-powered lessons help them understand the material more easily by giving clear explanations right away. Meanwhile, teachers noted that they use AI to break down lessons into simpler terms, making it easier for students to relate the concepts to real-life situations.

*"With AI, you can break down the information more, making it easier for us to understand the lessons."* [SR6, Week 2, In-person Interview]

*"Sometimes, I don't understand the topic easily, but with AI, it helps me understand it better."* [SR3, Week 1, In-person Interview]

*"I use AI to come up with ideas and find ways to apply and simplify the concepts I teach in real life."* [TR3, Week 2, Online Interview]

AI tools like ChatGPT make lessons easier by providing clear and simple explanations that fit students' understanding [34]. Likewise, NLP-powered systems improve students' conceptual understanding through real-time feedback and easy-to-digest content [35].

### *Efficient Output Projection*

Students recognized AI as a helpful tool in saving time, organizing outputs, and improving instructional productivity. Many reported that AI-integrated instruction made them work on school tasks faster, reducing repetitive workloads.

*"AI is more accessible, there's a lot more information, and I finish my outputs faster since the teaching process is more engaging."* [SR1, Week 1, In-person Interview]

*"These AI tools make learning more engaging, efficient, and accessible, requiring just a few clicks instead of shifting countless references and materials."* [SR5, Week 1, In-person Interview]

AI chatbots and assistants make school tasks easier and less boring [36]. Similarly, AI is found to help students be more efficient by automating everyday tasks and helping them manage time better [37].

## Negative Influences of AI on Students' Learning Styles

Although AI provides numerous advantages to student learning outcomes, learners highlighted that negative impacts can still arise from AI-supported instruction. Major concerns include overdependence and loss of student-teacher connection.

### *Overdependence on AI*

Despite the many benefits of AI, students raised concerns on overdependence. Learners admitted to relying much on AI for assignments, which affected their creativity, critical thinking, and academic honesty. As AI becomes integrated in pedagogy, it also impacts the way students adapt with these tools in their education.

*"It's crucial to ensure that no one becomes overly reliant on these tools. Over dependence on AI could weaken our own skills and hinder our abilities to think and work independently."* [SR3, Week 1, In-person Interview]

*"The only disadvantage of using AI is that it becomes addictive and we start becoming dependent on it when it comes to studying our lessons in class."* [SR6, Week 2, In-person Interview]

These findings support the concerns raised where using AI too much in education could impact student integrity and lessen intellectual effort [10]. If AI is not used responsibly, it could limit students' ability to think critically and analyze information [11]. As AI provides opportunities to accomplish tasks within a few clicks, it also poses significant risks on critical thinking as well as creativity [38].

### *Loss of Human Connection and Related Risks*

The use of AI in classrooms has led to less interaction between students and teachers. Some students mentioned that relying too much on digital tools can create an emotional distance, making the learning experience feel less personal. They also expressed concern about how this could affect communication with teachers and the overall teaching experience.

*"Whenever I notice that the instruction is AI-based, I feel disconnected with the teacher."* [SR7, Week 3, Online Interview]

*"Too much AI integration might affect the work of teachers; I fear that it could even replace them in the future."* [SR6, Week 2, In-person Interview]

There is a need to keep human interaction in AI-driven education to maintain the personal connection between teachers and students [29]. Although AI can support teaching, it cannot replace the empathy and social bond that come with traditional, human-centered learning [39].

### Cautions and Reliability Concerns of AI Use

Both students and teachers mentioned that being cautious is essential when using AI tools because they sometimes provide inaccurate information, generic responses, or raise ethical concerns. They emphasized the importance of verifying AI outputs, especially when it comes to technical or academic content. Issues regarding ethics and the responsible use of AI were also highlighted.

*"On the negative side, there are sometimes inaccuracies, like in our experiences, even though you know it's your work, it can still be flagged as AI-generated or plagiarized."* [SR2, Week 1, In-person Interview]

*"AI doesn't always give me exactly what I want to come out of the lesson. The topic tends to be too broad. It's not as specific as the content in the syllabus."* [TR2, Week 2, Online Interview]

*"It gives a lot of information but you can't be sure if that information is really accurate. Double-checking is highly important in using AI."* [TR4, Week 3, Online Interview]

In the same context, there is also a massive gap of AI concerning emotional nuances and reliability [40]. From this area of concern, developing ethical policies for responsible application of AI within education frameworks is urged [12].

## CONCLUSION

his qualitative study employed a phenomenological approach to explore the AI-integrated pedagogical trends used by teachers in their classrooms and their positive and negative influences on students' learning styles. Thematic analysis of hybrid semi-structured interviews revealed six main themes. Findings show that teachers frequently use AI tools for language support, content generation, and lesson planning. The utilization of these is rooted in peer influence, accessibility, ease of use, and technological modernization. Teachers primarily assess student learning through formative assessments and face-to-face interactions. Meanwhile, students perceived AI-supported instruction positively, highlighting its benefits such as personalized learning, increased engagement, and enhanced efficiency. However, concerns were raised regarding overreliance on AI, reduced teacher-student interaction, data privacy, and content reliability. These issues were found to negatively affect students' academic well-being. Based on the findings, future researchers should look into the long-term effects of AI in different school settings to understand its significant impact on student learning. It is also essential to find ways to address issues such as data privacy and content accuracy of AI tools. Schools should work in creating academic boundaries and ethical guidelines for using AI in classrooms to promote a harmonious and productive environment for students.

## LIMITATIONS

Although the study explored valuable insights on AI integration in pedagogy and its influence on learning styles, it still had limitations. The study did not fully cover all experiences of teachers and students due to restricted number of participants in the study. There were other AI tools, which were not covered but provide more ways to integrate them in education.

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## AUTHOR CONTRIBUTION

All authors contributed equally to the conception and design of the study, and all other parts. A.G. led the conceptualization and was primarily responsible for writing the introduction, results and discussion, and conclusion and recommendations, along with the data collection and revision. D.M. contributed to gathering related studies and writing the literature review and abstract. R.G. focused on writing the methodology, and coordinating with participants during data collection. J.V. contributed to the conceptualization, instrument validation, and editing the final paper.

## CONFLICT OF INTEREST

The authors declare no conflict of interest.

## DECLARATION OF USE OF AI IN SCIENTIFIC WRITING

The authors declared that this study was prepared, researched, written, and edited without the assistance of AI techniques.

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