Perceived Artificial Intelligence (AI) Integration in Pedagogical Practices Towards Students' Motivation in Science

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ABSTRACT

This study examined the perceived integration of Artificial Intelligence (AI) in pedagogical practices and its relationship to students' motivation in Science. Specifically, it determined the level of AI integration in terms of student awareness, views, and challenges, as well as the level of students' motivation across dimensions such as self-efficacy, active learning strategies, science learning value, performance goal, achievement goal, and learning environment simulation. A quantitative-descriptive correlational research design was employed, with data collected from Science students using a structured survey questionnaire. Descriptive statistics, including mean and were used to assess levels of AI integration and motivation, while Pearson's r was applied to test the relationship between the variables. Results indicated that students generally perceived AI integration positively, with high levels of awareness and favorable views, alongside manageable challenges related to accessibility and technical concerns. Students also demonstrated a high level of motivation in Science, particularly in terms of learning value, achievement goals, active engagement, and simulated learning environments, while performance goal motivation was comparatively lower. Correlation analysis revealed a positive, and statistically significant relationship between AI integration and students' motivation, suggesting that increased exposure to AI-supported instructional practices is associated with higher levels of student motivation. The findings imply that while AI integration is not without challenges, it serves as a valuable support in enhancing students' engagement and motivation in Science learning when effectively implemented.

Keywords: Artificial Intelligence, Pedagogical Practices, Student Motivation, Science Education, Active Learning, Achievement Goal

INTRODUCTION

Background of Study

Artificial Intelligence (AI) has become an important part of modern education, changing the way teachers deliver instruction and how students experience learning. AI tools such as adaptive learning platforms, intelligent tutoring systems, and automated feedback applications adjusted lessons according to students' individual needs, learning pace, and performance level. Research has shown that AI-supported learning environments improve student engagement, motivation, and academic achievement by providing personalized content and immediate feedback (Fatima & Khawar, 2025). In addition, studies in higher education have shown that AI-driven personalized instruction has increased students' performance and motivation when activities are aligned with their strengths and areas for improvement (Chávez Benavides et al., 2025). A systematic review further confirmed that integrating AI into teaching practices enhanced personalized learning by adapting instructional strategies to learners' specific needs (Merino-Campos, 2025). In subjects such as Science, where students often encounter abstract concepts and complex problem-solving tasks, the perceived integration of AI in pedagogical practices significantly influenced students' motivation, engagement, and overall learning outcomes.

However, despite the growing integration of AI in education, students' perceptions of AI-assisted pedagogical practices and how these perceptions influenced their motivation remained underexplored, particularly in basic and secondary science contexts (Slimi et al., 2025). While teacher-focused studies highlighted implementation challenges and institutional readiness, limited research directly examined student-centered perspectives. Moreover, although engagement and academic performance were linked to AI-assisted learning environments, the direct relationship between perceived AI integration and students' motivational constructs in science learning remained insufficiently investigated.

Moreover, understanding how students perceived Artificial Intelligence (AI) in teaching was important because their motivation in Science depended on many factors, such as confidence in their abilities, interest in learning, persistence, and engagement in class. How students viewed Artificial Intelligence—whether they found it useful, easy to use, and relevant—affected whether these tools truly helped them learn and stay motivated. This research was important because it helped teachers design better science lessons that effectively used AI, encouraged active learning, and increased students' motivation and performance. By studying students' perceptions, educators and policymakers made informed decisions on integrating AI in classrooms to support learning and inspire a positive attitude toward Science.

Research showed that students generally perceived AI positively when it enhanced accessibility, personalization, and support in learning tasks. However, studies also highlighted that limited exposure to AI tools and insufficient integration into classroom practices limited deeper student interaction with these technologies (Prestoza & Banatao, 2024). This suggested that positive perceptions alone were insufficient; meaningful, consistent implementation was necessary to maximize AI's educational benefits. In the Philippine educational context, educators recognized the instructional potential of AI but reported significant challenges related to infrastructure limitations, technological readiness, and professional training (Mangubat & Paglinawan, 2025). These constraints affected the extent to which AI was effectively integrated into classroom instruction. Although existing literature established a connection between AI-supported engagement and improved academic outcomes (Villaver & Cabigas, 2025), most studies focused on teachers' perspectives, system implementation, or general performance indicators. There was still limited empirical evidence examining students' perceptions of AI integration and how these perceptions directly influenced their motivation to learn Science. This gap underscores the need for student-centered research examining the relationship between perceived AI integration and motivational constructs in science education. Addressing this gap contributed to a deeper understanding of how AI implementation affected not only learning outcomes but also students' intrinsic motivation to engage in science learning.

This study aimed to investigate the perceived integration of Artificial Intelligence in pedagogical practices in terms of students' awareness, views, and challenges, and to examine its relationship with students' motivation in Science, including self-efficacy, active learning strategies, science learning value, performance goal, achievement goal, and learning environment simulation. Specifically, it also sought to ascertain whether there was a significant relationship between perceptions of AI integration and students' motivation to learn Science. By focusing on students' perceptions in science classrooms, this study aimed to address existing research gaps regarding how perceived AI integration affected intrinsic and extrinsic motivation, particularly in developing educational contexts where AI adoption was still emerging. This study addressed the gap by investigating the relationship between perceived AI integration in pedagogical practices and students' motivation in Science, thereby contributing empirical evidence to support curriculum innovation and technology-enhanced instruction in the BSED Science programs of Don Carlos Polytechnic College, Don Carlos, Bukidnon, for the academic year 2025–2026.

Statement of the Problem

The main purpose of this study was to determine the perceived level of Science Education students at Don Carlos Polytechnic College regarding AI integration in pedagogical practices towards motivation in the science subject.

Specifically, it sought to answer the following questions:

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What is the level of AI integration in pedagogical practices in Science as perceived by science students in terms of:

- Student Awareness;
- Student Views; and
- Student Challenges?

What is the level of students' motivation in Science in terms of:

- self-efficacy;
- active learning strategies;
- science learning value;
- performance goal;
- Achievement goal;and
- Learning environment simulation?

Is there a significant relationship between students' perception level of Artificial Intelligence (AI) integration in pedagogical approaches and the level of impact on students' motivation in Science?

Objectives of the Study

The main objective of the study was to determine the perceived level of students on AI integration in pedagogical practices towards motivation in the science subject of Science Education in Don Carlos Polytechnic College.

Specifically, it aimed to answer with the following statements:

determine the perception level of AI integration in pedagogical practices as perceived by science students in terms of:

- Student Awareness;
- Student Views; and
- Student Challenges;

identify the level of impact towards students' motivation in Science in terms of:

- self-efficacy;
- active learning strategies;
- science learning value;
- performance goal;
- Achievement goal; and
- Learning environment simulation; and

ascertain whether there is a significant relationship between the perceived level of AI integration in pedagogical practices and its impact on students' motivation in Science.

Hypothesis of the Study

The alternative hypothesis was formulated based on the given objectives and tested at the 0.05 significance level.

Ha: There is a significant relationship between students' perception of AI integration in pedagogy and its impact on students' motivation in the Science subject among science students at Don Carlos Polytechnic College.

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Significance of the Study

The result of this study was beneficial to the students, teachers, parents, school administration, researchers, and future researchers who would like to refer to the results of the study:

To the school administrators, they may use the findings to make informed decisions about curriculum development, resource allocation, and institutional policies related to AI integration in science education. The study may serve as a basis for developing strategic plans aligned with global educational technology trends and ethical AI implementation frameworks promoted by international organizations.

To the teachers, most especially to science teachers, the study may offer empirical evidence regarding the effectiveness of AI integration in enhancing student motivation. The results may guide educators in selecting appropriate AI-based instructional tools, designing learner-centered science lessons, and addressing challenges such as technological barriers and student misconceptions about AI. Furthermore, it may inform professional development programs aimed at strengthening teachers' competencies in AI- assisted pedagogy.

To the Students, particularly those in science courses, this study may provide insight into how AI-enhanced instructional strategies (e.g., intelligent tutoring systems, adaptive learning platforms, and AI-powered simulations) influence their motivation, curiosity, and academic engagement. By identifying students' awareness, views, and challenges regarding AI integration, the study may help improve personalized learning experiences, foster deeper conceptual understanding, and enhance intrinsic motivation in science learning.

To the parents, they may benefit from understanding how AI tools are being integrated into science education and how these tools affect their children's motivation and academic performance. The findings may help parents support responsible, productive AI use at home, encourage digital literacy, and address concerns about ethical AI use, screen time, and academic integrity.

To future researchers, this study may contribute to the growing body of literature on AI in education by examining its relationship with students' motivation in Science. Future researchers may use the findings as a reference for comparative studies, experimental research designs, or longitudinal investigations on AI-driven instructional practices. It may also encourage further exploration of related variables such as academic performance, self- efficacy, and digital literacy. Future researchers may use the findings as a reference for comparative studies, experimental research designs, or longitudinal investigations on AI-driven instructional practices. It may also encourage further exploration of related variables such as academic performance, self-efficacy, and digital literacy.

Scope and Limitations

This study focused on the perceived integration of Artificial Intelligence (AI) in pedagogical practices and its relationship to students' motivation in Science. It specifically examined first- to third-year BSED Science students enrolled at Don Carlos Polytechnic College during the Academic Year 2025–2026. The respondents were selected because they were directly exposed to science instruction and AI-supported learning practices within the institution.

The study aimed to determine students' perceptions of AI integration in terms of its relevance, usefulness, and instructional impact, as well as its association with their motivation in Science. Data were collected using an adapted survey questionnaire from Abubakar, Onasanya, and Ibrahim (2024), modified to fit the study's context. Participants voluntarily answered and signed the survey for documentation purposes. The collected data were analyzed using appropriate descriptive and inferential statistical tools. This study was limited to students' self-reported perceptions and motivation and did not include teachers' perspectives, experimental interventions, or academic performance measures.

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Definition of Terms

This study used the following terminologies, which were operationally defined:

Achievement goal refers to the cognitive, future-focused, and purpose-driven aims that guide a person's competence-related behavior in achievement settings. These goals, often divided into mastery (skill development) and performance (demonstrating ability) types, determine how individuals interpret, approach, and respond to challenges, ultimately shaping their motivation and learning outcomes.

Active learning strategies refer to a broad range of instructional methods that engage students in the learning process through activities such as discussion, problem-solving, case studies, and team-based projects. These strategies require students to go beyond passively receiving information and instead actively construct knowledge by applying, analyzing, or synthesizing course material.

Artificial Intelligence (AI) integration refers to the process of embedding artificial intelligence (AI) technologies such as machine learning, natural language processing (NLP), and computer vision directly into an organization's existing systems, applications, and workflows.

Learning environment simulation refers to an interactive, often immersive educational technique that mimics real-world situations, systems, or processes, providing learners with a safe, controlled space for practice, experimentation, and skill acquisition.

Pedagogical Practices refers to the methods, strategies, and actions teachers employ to facilitate student learning, encompassing instructional techniques, curriculum design, and assessment. These practices involve both planning and classroom interaction to foster knowledge acquisition, critical thinking, and engagement.

Performance goal refers to specific, measurable, short-term objectives that define success for an employee's role and align their daily work with company-wide strategic objectives. They focus on core job duties, productivity, and outcomes to track progress, increase accountability, and determine performance evaluations, rewards, or career advancement.

Science learning value refers to the extent to which students perceive Science, scientific inquiry, and related activities as useful, relevant, and worthwhile to engage in. It is a critical component of motivation that influences a student's willingness to engage in scientific tasks, think critically, and apply Science to their daily lives.

Self-efficacy refers to an individual's belief in their capacity to execute behaviors and organize actions required to achieve specific goals.

Student Awareness refers to a cognitive state where students are informed, conscious, and knowledgeable about their learning processes, academic requirements, institutional policies, and personal, social, and emotional experiences. It encompasses understanding subject content, utilizing resources, and navigating the campus environment to boost academic performance and personal development.

Student Views refers to students' perspectives, perceptions, and attitudes regarding their educational experiences, including teaching methods, learning environments, curriculum, and institutional policies. It encompasses how students interpret and react to their academic journey, influencing educational effectiveness and curriculum development.

Student Challenges refers to the various academic, personal, financial, and mental health obstacles that hinder a learner's performance and well- being. Common examples include poor time management, high-stress levels, financial pressure from tuition, difficulty understanding complex subjects, and a lack of a support system.

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THEORETICAL FRAMEWORK

This chapter consists of the relevant literature and studies that helped shape the theoretical and conceptual framework of the study.

Review of Related Literature and Studies

AI Integration in Pedagogical Approaches

According to the systematic review by Zawacki-Richter et al. (2020), which examined artificial intelligence applications in higher education, intelligent tutoring systems, learning analytics, and adaptive learning platforms were identified as the most common AI-driven tools. Their findings suggest that these technologies contribute to personalized instruction by adapting content to learners' needs, providing real-time feedback, and enhancing student engagement. However, the authors emphasized that most existing studies focus on technical implementation and learning performance rather than students' subjective experiences. They highlighted the need for further investigation into students' perceptions and motivational outcomes, particularly within discipline-specific areas such as science education. This implies that while AI tools demonstrate instructional value, their influence on motivation remains insufficiently explored.

Similarly, Holmes et al. (2022) argued that AI in education has significant potential to promote learner autonomy, provide immediate feedback, and offer adaptive scaffolding. These features align closely with theories of intrinsic motivation, as students are more likely to engage deeply when learning experiences are personalized and responsive. Their work stresses that AI integration must be pedagogically grounded to ensure meaningful improvements in conceptual understanding, especially in STEM disciplines. They caution that technology alone does not guarantee improved motivation or learning outcomes; instead, effective instructional design determines its impact.

In examining student perceptions, Chatterjee and Bhattacharjee (2020) applied the Technology Acceptance Model (TAM) to analyze AI adoption in higher education. Their findings revealed that perceived usefulness and perceived ease of use significantly predict students' behavioral intention to use AI technologies. This indicates that students' attitudes toward AI systems directly affect their willingness to engage with them. Consequently, motivation to participate in AI-supported learning environments is strongly influenced by students' perceptions of the practicality and accessibility of these tools.

Regarding student awareness, Mieczkowski (2020) found that learners with greater awareness of AI technologies exhibit higher confidence and readiness to adopt them for academic tasks. Awareness serves as a foundational factor that shapes positive perceptions and increases engagement with AI-powered systems. When students understand how AI functions and how it supports their learning, they are more likely to interact purposefully with these tools. Likewise, the synthesis by Holmes, Bialik, and Fadel (2022) highlights that informed learners tend to use AI systems more strategically. In science education contexts, such awareness fosters self-directed learning, curiosity, and active participation, key components of academic motivation.

Despite these findings, a common limitation across the reviewed studies is that most research concentrates on system effectiveness, adoption, or general performance outcomes rather than explicitly examining the direct relationship between students' perceived AI integration and their motivation in science education. Although awareness, perceived usefulness, and adaptive features are linked to engagement, empirical evidence remains limited in explaining how these perceptions translate into sustained motivational constructs. This gap underscores the need for student-centered research that directly investigates how perceived AI integration influences motivation in science learning contexts.

Xiaoyu et al. (2025) conducted a systematic review on the use of generative artificial intelligence in pedagogical practices. Their study found that AI tools support teachers in instructional design, lesson planning, and feedback generation. The results showed that AI integration improves student engagement,

personalized learning, and learning efficiency in different educational settings. Moreover, Rafael (2024) conducted a meta-synthesis on teachers' pedagogical practices using artificial intelligence tools. The study found that AI supports lesson customization, adaptive assessment, and personalized feedback for students, which improves the overall teaching and learning process.

Student Views

Chatterjee and Bhattacharjee (2020) investigated students' acceptance of AI technologies in higher education using the Technology Acceptance Model (TAM). Their findings indicated that students' positive views of AI, particularly regarding its usefulness in simplifying learning tasks and providing personalized feedback, strongly predicted their willingness to engage with AI tools. Students who held favorable opinions were more likely to perceive AI integration as beneficial, linking their views directly to motivation and engagement in learning. Similarly, Holmes, Bialik, and Fadel (2022) explored global student perceptions of AI in educational contexts. They found that students' views were shaped by their experience with AI tools, the clarity of AI's purpose, and their confidence in interacting with technology. Students who expressed positive views often reported increased curiosity and engagement. In contrast, those with neutral or negative views demonstrated hesitation, suggesting that attitudinal disposition is a crucial factor in motivating AI-assisted learning.

Moreover, De Leon et al. (2025) examined students' attitudes toward AI-enhanced learning platforms. The study found that students who held favorable views of the usefulness and efficiency of AI tools were more likely to participate actively in AI-mediated learning activities. The researchers concluded that positive student views not only encourage adoption but also enhance motivation and academic engagement in learning tasks.

According to Galagala (2025), the study focused on university students' perceptions of AI integration in academic learning. They found that students' views regarding AI's role in improving learning efficiency, providing personalized guidance, and fostering problem-solving skills were strongly linked to motivation and satisfaction. Positive perceptions often translated into active use of AI tools and higher engagement, while negative views hindered adoption.

Student Challenges

Huang et al. (2025) reported that students encountered challenges related to the trust and reliability of AI systems, particularly chatbots and adaptive platforms. Some students expressed concerns that AI-provided feedback could be inaccurate or biased, which reduced their confidence in the technology. The study concluded that students' challenges with AI credibility can affect both motivation and learning outcomes.

Research by De Leon (2025**)** identified accessibility issues as key challenges for students, including inconsistent internet connectivity, limited access to devices, and a lack of prior exposure to AI tools. Additionally, students with low awareness of AI's pedagogical roles struggled to use AI effectively, highlighting that challenges in knowledge and access are interrelated and influence motivation to learn. However, Chatterjee and Bhattacharjee (2020) highlighted that students often face technical challenges, including unfamiliarity with AI systems, limited access to required devices, and difficulty navigating AI-based platforms. These challenges negatively impacted students' willingness to engage with AI tools and limited the motivational benefits that AI integration could offer. The study emphasizes the importance of support and training to mitigate technical obstacles.

Students Motivation towards Science

More recently, King et al. (2025) conducted a scoping review on chatbots and student motivation. Their analysis demonstrated that AI-driven conversational agents can enhance students' academic motivation by providing real-time assistance, personalized feedback, and interactive support. The study emphasized that

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motivational gains are strongly influenced by learners' perceptions of AI credibility, usefulness, and interactivity.

In another 2025 study, Saeed H. Alshammari and colleagues investigated determinants of student adoption of AI applications in higher education. The researchers found that trust in AI systems, technological readiness, and perceived academic benefits significantly influence students' willingness to use AI tools. Importantly, motivational constructs such as engagement and satisfaction were positively associated with AI adoption.

Focusing on teacher and student perspectives, Sergio Bećirović, Elma Polz, and Irma Tinkel (2025) examined AI adoption among university students in teacher education programs. Their findings revealed that positive attitudes toward AI integration correlate with higher academic motivation and perceived learning effectiveness, suggesting that perception mediates the relationship between AI integration and motivational outcomes.

Self-efficacy

A systematic review conducted by Olaf Zawacki-Richter et al. (2020) revealed that AI-powered adaptive learning systems and intelligent tutoring platforms can enhance students' confidence by providing immediate feedback and personalized support. When students receive timely and constructive feedback, they are more likely to feel competent in completing academic tasks, thereby strengthening self-efficacy beliefs.

Similarly, Wayne Holmes, Maya Bialik, and Charles Fadel (2022) noted that AI technologies support scaffolded learning experiences. These scaffolded interactions allow students to progress at their own pace, reducing frustration and promoting mastery experiences, which are among the primary sources of self-efficacy, according to Bandura. In science education, where learners often encounter complex concepts, AI-assisted scaffolding may enhance confidence and task persistence.

Active Learning Strategies

A systematic review by Zawacki-Richter et al. (2020) found that AI applications such as intelligent tutoring systems, adaptive quizzes, and predictive analytics facilitate active engagement by personalizing tasks and encouraging student interaction. Their findings suggest that AI integration supports participatory learning environments rather than passive instruction.

In examining AI chatbots and learning interaction, Weiqing Huang, Jian Jiang, and Ronnel B. King (2025) reported that conversational AI tools encourage students to ask questions, clarify misconceptions, and actively participate in learning dialogues. Such interaction promotes autonomy and sustained motivation, core outcomes of active learning strategies. Furthermore, research on AI adoption by Sourav Chatterjee and Krishna Kumar Bhattacharjee (2020) suggests that students who perceive AI as useful and easy to use are more likely to engage in exploratory and participatory learning behaviors. Positive perceptions facilitate deeper involvement in AI-mediated academic tasks.

Science learning value

Eccles and Wigfield (2020) reaffirmed that students' task value, particularly utility value and intrinsic value, strongly predict academic motivation and persistence in STEM fields. Their updated review of Expectancy-Value Theory emphasizes that when students perceive science as useful for future careers or personally meaningful, they demonstrate higher engagement and sustained effort.

In their scoping review, King and colleagues (2025) found that AI chatbots supporting academic clarification increased students' perception that course materials were accessible and applicable. When students perceived science lessons as easier to understand and relevant to their goals, their intrinsic motivation increased.

Performance Goal

Choi and Jeong (2021) studied AI-adaptive learning platforms in middle school science classes. They found that students with strong performance goals were more motivated to complete AI-guided tasks accurately and efficiently, especially when the system provided immediate feedback and scoring metrics. Students focused on demonstrating competence were encouraged to engage consistently with AI-supported learning modules. Moreover, Holmes et al. (2022) noted that AI-supported tools offering progress dashboards, badges, and achievement recognition align closely with students' performance goal orientations. Students motivated by high achievement were observed to engage more with adaptive exercises and challenging tasks, thereby increasing task completion rates and observable outcomes in science learning.

In higher education, Alshammari (2025) reported that performance-oriented students were particularly responsive to AI environments that provided structured learning paths and measurable outcomes. These students often used AI tools strategically to demonstrate competence, linking performance goal orientation to motivated engagement with technology.

Achievement goal

Holmes et al. (2022) emphasized that AI-driven feedback systems can support both mastery and performance achievement goals. Mastery-focused students benefit from exploratory feedback, which promotes self-directed learning and problem-solving, while performance-focused students respond to quantitative progress indicators. The dual support encourages balanced motivation in science learning.

Recent studies highlight the relationship between AI integration and achievement goals. Ali, Chen, and colleagues (2025) investigated the role of AI literacy and resilience in students' engagement and motivation. Their study found that learners with higher AI literacy demonstrated stronger mastery-oriented behaviors, setting adaptive achievement goals and engaging more deeply with AI-supported learning tasks. This suggests that students' ability to understand and use AI tools influences the types of goals they adopt during learning.

Similarly, Xu, Li, and Zhang (2025) examined how AI-driven personalized feedback affects students' goal achievement and engagement. The study revealed that personalized feedback not only clarified students' academic goals but also reinforced both mastery- and performance-oriented goal pursuits. Students who received adaptive feedback were more motivated to achieve competence and succeed in measurable outcomes, showing that AI integration can directly support goal-directed behaviors.

Zhao, Wang, and Liu (2025) conducted a qualitative study exploring Chinese youth students' goals for AI adoption. Their findings indicated that students approached AI-supported learning with a variety of achievement goals, including mastery goals such as deep understanding and skill development, as well as performance goals aimed at gaining recognition or outperforming peers. This study emphasizes that AI integration can accommodate multiple goal orientations depending on students' intentions and motivational dispositions.

Learning Environment Simulation

Recent research highlights the benefits of learning environment simulations in AI-integrated science education. Zawacki-Richter (2020) conducted a systematic review of AI applications in higher education and found that virtual simulations enhanced experiential learning by providing students with opportunities to experiment, test hypotheses, and receive real-time feedback. The study concluded that AI-powered simulations promote both conceptual understanding and motivation in STEM subjects.

Holmes, Bialik, and Fadel (2022) explored how AI-based simulations and virtual labs improve student engagement in science. Their study reported that simulations enabled students to manipulate variables, visualize complex phenomena, and receive adaptive guidance, thereby strengthening both learning outcomes

and students' intrinsic motivation. Students reported higher interest in science topics when they could see the practical applications of concepts through interactive simulations.

De Leon (2025) explored students' perceived usefulness of AI tools, including virtual laboratories and simulation software, in enhancing science learning. They found that students perceived AI simulations as highly valuable for understanding abstract concepts and linking theory to practice, which positively influenced both the perceived value of science learning and achievement motivation.

Huang (2025) investigated AI chatbots and simulation- based learning in STEM education. They found that students using AI-driven simulations were more willing to engage in iterative experimentation and problem-solving, supporting mastery-oriented achievement goals. Real-time guidance provided by AI enhanced students' confidence and self-efficacy, fostering sustained motivation.

CONCEPTUAL FRAMEWORK

The study is anchored on established motivational, technological, and constructivist learning theories that explain how AI-supported instruction influences students' motivation and engagement in science learning. First is the Technology Acceptance Model (TAM) by Fred Davis (Davis, 1989). In this study, students' awareness, views, and challenges regarding AI integration reflect their perception of AI's usefulness and ease of use.

When students perceive AI tools as helpful in understanding scientific concepts and easy to operate, they are more likely to accept and engage with AI-enhanced instruction. Contemporary research confirms that perceived usefulness significantly predicts students' motivation and intention to use AI in educational settings (Alam, 2021; Chatterjee & Bhattacharjee, 2020).

Additionally, it is anchored in Self-Determination Theory (SDT) by Edward L. Deci and Richard M. Ryan. Self-Determination Theory (SDT), in 1985, explains that motivation is enhanced when three basic psychological needs are satisfied: autonomy, competence, and relatedness. AI-integrated pedagogical practices in science—such as adaptive learning systems, AI tutoring platforms, and automated feedback tools—support personalized pacing and real-time feedback. These features may strengthen students' perceived competence and autonomy, thereby increasing intrinsic motivation.

According to Ryan and Deci (2020), environments that support psychological needs promote deeper engagement and sustained academic motivation. Self-Determination Theory (SDT), developed by Edward L. Deci and Richard M. Ryan (1985), is a theory of human motivation that explains why individuals engage in certain behaviors and what sustains motivation. The theory emphasizes that people are naturally inclined toward growth, learning, and psychological development when their basic psychological needs are supported.

Research Paradigm

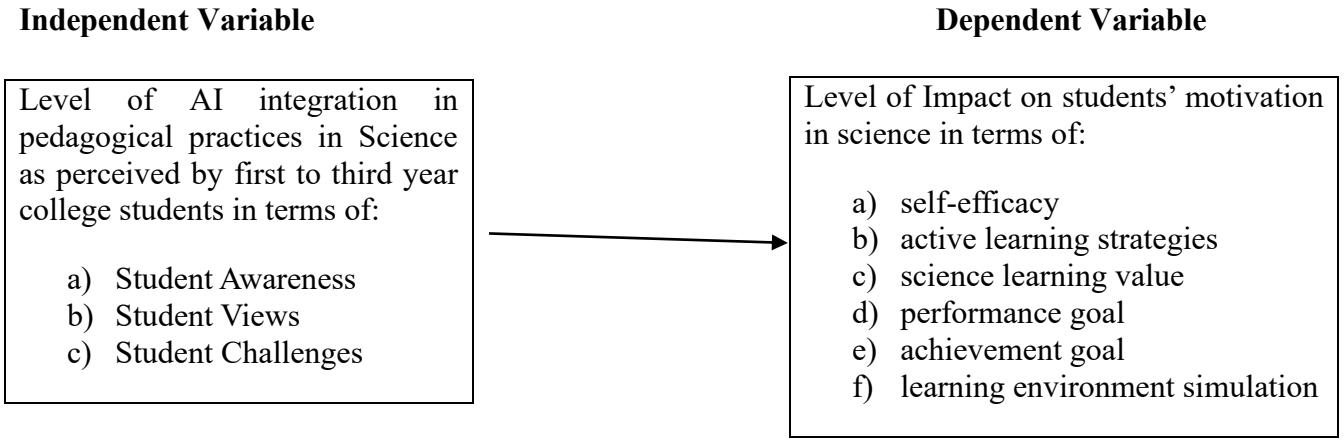


Figure 1. Schematic Diagram showing the Independent and Dependent Variables

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METHODOLOGY

This chapter deals with the methods and procedures to be used in this study. It included the research design, research locale, the respondents of the study, the research instrument, the administration of the instrument, the collection of the questionnaire, the scoring procedures, and the statistical treatment of the data gathered.

Research Design

This study employed a descriptive–correlational research design. The descriptive component assessed the level of students' perceived integration of artificial intelligence (AI) into pedagogical practices and their motivation in Science.The correlational component examined whether a significant relationship existed between perceived AI integration and students' motivation in Science. This design was appropriate because the study sought to describe existing conditions and determine relationships among variables without manipulating them.

Locale of the Study

This study was conducted at Don Carlos Polytechnic College located in the Municipality of Don Carlos, Bukidnon. The institution was situated in the northeastern part of the municipality, specifically at P-2, Poblacion Norte, Don Carlos, Bukidnon, 8712. The college served as one of the key higher education institutions in the locality and provided accessible tertiary education to students within the municipality and nearby areas.

The institution was chosen as the research locale because it primarily offered teacher education programs, where students were actively engaged in pedagogical training and instructional practices that might incorporate emerging technologies such as Artificial Intelligence (AI). Since the study focused on students' perceptions of AI integration and its relationship to their motivation in Science, selecting a college that integrated instructional innovation within teacher education programs ensured relevance to the research objectives. Additionally, the researchers were affiliated with the institution, which facilitated proper coordination, data collection, and ethical compliance while ensuring access to the required respondents. The accessibility of participants and institutional support further justified the selection of this research setting.

Map of the Locale of the Study

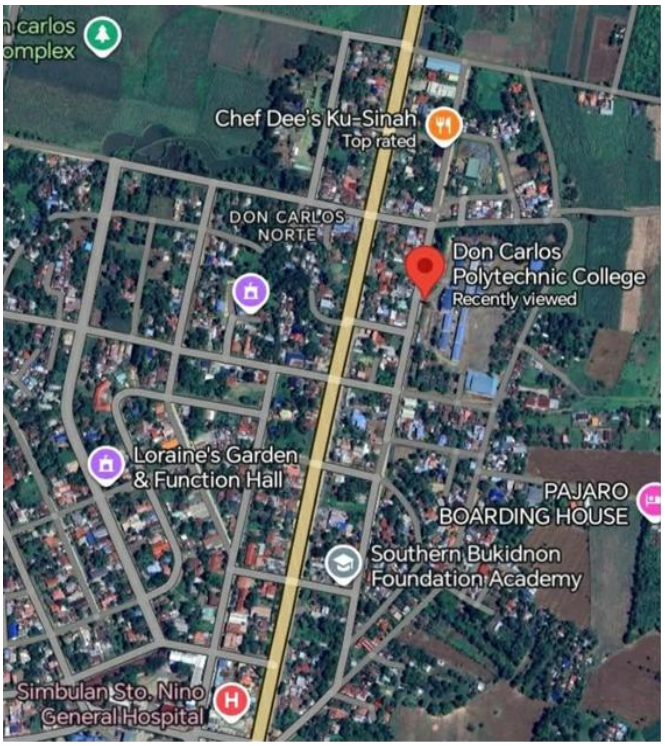


Figure 2. Map of Don Carlos Polytechnic College, Don Carlos, Bukidnon.

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Respondents of the Study

This study specifically selected first to third-year students of Don Carlos Polytechnic College who were officially enrolled during the Academic Year 2025–2026. The respondents were selected from the three (3) year levels of the Bachelor of Secondary Education (BSED) sections majoring in Science, as these students were directly exposed to pedagogical training and instructional practices in which Artificial Intelligence (AI) integration could be applied and observed.

A total of 204 students were selected as respondents through Total Enumeration Sampling from the identified year levels. The Population size was determined by participant accessibility and the need to obtain sufficient data for meaningful statistical analysis while maintaining manageable data collection. Total Enumeration sampling was used to ensure fairness, eliminate selection bias, and enhance the data total enumeration within the specified population.

These participants were chosen because they actively engaged in teaching and learning practices aligned with the study's objectives. Their academic exposure to science instruction and potential interaction with technology-integrated pedagogy made them appropriate respondents for examining perceptions of AI integration and its relationship to motivation in science learning. Furthermore, their availability and accessibility facilitated efficient data gathering.

Additionally, pilot testing was conducted among fourth-year science major students to refine the research instruments and procedures prior to the main data collection.

Sampling Procedure

Since the study included all 204 BSED Science students from the first to third years, the research used total enumeration sampling. Total enumeration was a non-probability sampling technique in which all members of the identified population were included as respondents. This method was appropriate because the population size was manageable and accessible. By including all qualified students, the study ensured comprehensive data collection and eliminated sampling bias within the defined group. Because all identified students were included, random sampling and purposive sampling were no longer applied. The use of total enumeration ensured that the data gathered accurately represented the entire population of BSED Science students from first to third year.

Research Instrument

The study adapted the survey questionnaire developed by Abubakar, U., Onasanya, S. A., and Ibrahim, H. A. (2024) for their study, "Student Perspectives and Impact of AI Integration in Pedagogical Practices in Nigerian Tertiary Institutions." The original instrument was designed to measure students' perceptions regarding the integration and impact of artificial intelligence (AI) in pedagogical practices in higher education contexts. It provided a structured framework for assessing learners' perceptions of AI-supported teaching strategies and educational innovation.

For the present study, the adapted questionnaire was modified to align with the objectives of examining perceived AI integration in pedagogical practices and its relationship to students' motivation in Science.

The original instrument used a five-point Likert scale; however, for this research, it was revised to a four-point rating scale to eliminate neutral responses and encourage more decisive participant feedback—this modification aimed to enhance response clarity and strengthen the interpretability of the collected data. Moreover, prior to interpreting and analyzing the study, reverse scoring was applied. Reverse scoring was important in a thesis because it ensured the accuracy and consistency of responses in survey questionnaires. It was used when some statements were negatively worded so that all items in the scale measured the construct in the same direction. By reversing the scores, researchers prevented response bias, improved data reliability, and ensured that higher scores consistently represented the same level of the measured variable.

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Prior to full implementation, the modified instrument underwent pilot testing to determine its reliability and validity. The adapted instrument has a Cronbach's alpha value of 0.905. The pilot test ensured that the questionnaire was contextually appropriate, internally consistent, and capable of generating accurate and dependable data for statistical analysis.

Administration of the Research Instrument and the Data Gathering Procedure

The researchers first obtained approval from the College Dean of Teacher Education before conducting the study. They provided a letter outlining their research, and upon approval, they distributed survey questionnaires to teacher education students. Students were asked to sign informed consent forms before participating. The research team then collected the data and assisted students as needed in completing the questionnaires.

The researchers employed an adapted survey questionnaire to determine the perceived level of AI integration in pedagogical practices and its effect on students' motivation in the science subject. The survey involved administering structured questionnaires. The questionnaires were distributed to the selected respondents, and they were given sufficient time to complete them. The completed questionnaires were collected, and the data were analyzed to gain insights relevant to the study.

The anonymity and confidentiality of the learners were preserved by not requiring their names or identities during data collection. Copies of all respondents' responses were kept for possible reference in matters related to this study.

Scoring Procedure

The 4-point scale was employed to quantify and analyze student responses, transforming subjective opinions into numerical data for statistical interpretation.

Pedagogical Approaches towards Students' Motivation in Science

Scale	Range	Descriptive Rating	Qualitative Interpretation
4	3.26-4.00	Strongly Agree	Very Positive Perception
3	2.51-3.25	Agree	Positive Perception
2	1.76-2.50	Disagree	Negative Perception
1	1.00-1.75	Strongly Disagree	Very Negative Perception
Scale	**Range**	**Descriptive Rating**	**Qualitative Interpretation**
4	3.26-4.00	Strongly Agree	Very High Motivation
3	2.51-3.25	Agree	High Motivation
2	1.76-2.50	Disagree	Low Motivation
1	1.00-1.75	Strongly Disagree	Very Low Motivation

Ethical Consideration

In conducting the study, several ethical considerations were upheld. Firstly, informed consent was obtained from all participants, ensuring they were fully aware of the study's purpose, procedures, and potential risks and benefits before deciding to participate. Confidentiality and anonymity were maintained throughout the research process, with all data and personal information kept secure and only accessible to authorized researchers. Participants had the right to withdraw from the study at any time without consequences. The research adhered to ethical guidelines and regulations established by relevant governing bodies to ensure that participants' well-being and rights were protected. Lastly, the study's findings were reported accurately and objectively, with proper acknowledgment.

Statistical Treatment

The data gathered in this were collated, tabulated, integrated, analyzed, and interpreted using descriptive and inferential statistics. Data processing was done using Microsoft Excel and the Statistical Package for the Social Sciences (SPSS) for Windows (updated version).

For Problem 1, the weighted mean was used to determine the perception level of AI integration in pedagogical practices.

For Problem 2, the weighted mean was used to assess students' motivation in Science.

For Problem 3, a Pearson correlation analysis was conducted to determine whether there is a statistically significant relationship between perceptions of AI integration in pedagogical practices and students' motivation in science subjects among first- to third-year students at Don Carlos Polytechnic College. The level of significance was set at 0.05.

Presentation, Analysis and Interpretation Of Data

This chapter presents, analyzes, and interprets data gathered from survey questionnaires to investigate the perceived level of science students regarding AI integration in pedagogical practices towards motivation in science subjects at Don Carlos Polytechnic College.

AI integration in pedagogical practices in Science

Student Awareness

Table 1 presents the level of AI integration in pedagogical practices in Science in terms of student awareness. The results indicate that respondents had a very positive perception, with an overall mean of 3.41, interpreted as "Strongly Agree". This suggests that students are generally knowledgeable about the role and potential of Artificial Intelligence in education.

Table 1 shows an overall mean of 3.41 (Strongly Agree) with a Very Positive Perception, indicating that students have a high level of awareness of the integration of Artificial Intelligence (AI) into Science pedagogy. This suggests that learners are knowledgeable about AI concepts and recognize their importance in enhancing teaching and learning processes. The high mean score for awareness of AI's benefits in education (3.64) and understanding of its role in improving educational quality (3.61) is supported by the study of Zawacki-Richter et al. (2019), who emphasized that students and educators increasingly recognize AI as a transformative tool that enhances instructional delivery and learning outcomes. Their findings highlighted that awareness of AI applications has increased significantly due to their growing presence in educational systems.

Table 1. Level of AI integration in pedagogical practices in Science in terms of Student Awareness

Indicators	Mean	Qualitative Interpretation
I am aware of the potential benefits of using AI technologies in education	3.64	Very Positive Perception
I understand how AI technologies can improve the quality of education.	3.61	Very Positive Perception
I am familiar with the various applications of AI in educational settings	3.36	Very Positive Perception
I am confident in my knowledge about the potential of AI technologies in education.	3.27	Very Positive Perception
AI can facilitate adaptive learning, catering to individual student needs	3.38	Very Positive Perception

I believe AI can contribute to improving accessibility and inclusivity in education.	3.40	Very Positive Perception
AI technologies can provid personalized learning experiences.	3.34	Very Positive Perception
AI-powered tutoring systems can supplement traditional classroom instruction.	3.28	Very Positive Perception
AI can assist in identifying students' learning gaps and providing targeted interventions.	3.33	Very Positive Perception
I am interested in learning more about the role of AI in education.	3.46	Very Positive Perception
Overall Mean	3.41	Very Positive Perception

Legend:

Scale	Range	Descriptive Rating	Qualitative Interpretation
4	3.26-4.00	Strongly Agree	Very Positive Perception
3	2.51-3.25	Agree	Positive Perception
2	1.76-2.50	Disagree	Negative Perception
1	1.00-1.75	Strongly Disagree	Very Negative Perception

Similarly, the strong awareness of AI's role in personalized learning, adaptive instruction, and inclusivity (means ranging from 3.34 to 3.40) aligns with the findings of Holmes et al. (2021), who reported that AI technologies support individualized learning pathways and improve accessibility for diverse learners. This indicates that students in the present study are not only aware of AI but also understand its pedagogical value in addressing different learning needs in Science education.

Furthermore, the high level of interest in learning more about AI (3.46) supports the study of Bond et al. (2020), which found that students demonstrate a growing curiosity and openness toward emerging educational technologies, particularly AI, as these tools create engaging and interactive learning environments.

However, the slightly lower mean scores for confidence in knowledge (3.27) and familiarity with AI applications (3.36) suggest that, while students are aware of AI, they may lack a deeper understanding or practical exposure to it. This is consistent with the findings of Ng et al. (2021), who noted that although students are generally aware of AI technologies, many still have limited AI literacy, particularly in terms of technical knowledge and hands-on experience.

In addition, Chassignol et al. (2018) emphasized that awareness of AI does not always translate into competence, as students often need structured guidance and formal instruction to fully understand and utilize AI tools effectively. This explains the slight gap observed in the respondents' confidence levels in the present study.

Moreover, recent findings by Kasneci et al. (2023) highlight that students today are increasingly exposed to AI-powered tools, which enhances their awareness but also calls for deeper critical understanding and responsible use. This supports the current result that students are highly aware but still require further engagement and training.

Student Views

Table 2 presents the level of AI integration in pedagogical practices in Science, as perceived by students. The results indicate an overall mean of 3.35, reflecting a very positive perception of AI integration among students. This suggests that students generally view Artificial Intelligence as a valuable and beneficial component of their learning experience.

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Table 2 presents the level of AI integration in pedagogical practices in Science, based on student views, with an overall mean of 3.35 (Strongly Agree), interpreted as a Very Positive Perception. This indicates that students generally hold favorable attitudes toward the use of AI technologies in their academic learning, particularly in Science education.

The highest mean (3.49) shows that students strongly believe that integrating AI into academic activities enhances learning experiences. This finding is supported by Holmes et al. (2021), who emphasized that AI technologies enrich learning environments by providing interactive, adaptive, and efficient instructional support. Their study highlights that students perceive AI as a tool that improves both the quality and accessibility of education.

Table 2. Level of AI integration in pedagogical practices in Science in terms of Student Views.

Indicators	**Mean**	**Qualitative Interpretation**
Integrating AI technologies into academic activities can enhance learning experiences	3.49	Very Positive Perception
AI integration can make learning more engaging and interactive	3.34	Very Positive Perception
I am interested in using AI-powered tools and resources for my academic tasks	3.41	Very Positive Perception
AI integration is a valuable addition to traditional teaching methods.	3.39	Very Positive Perception
AI technologies can enhance collaboration and communication among students	3.33	Very Positive Perception
I am excited about the potential of AI to enhance my academic performance.	3.33	Very Positive Perception
AI technologies can foster creativity and innovation in academic projects.	3.37	Very Positive Perception
AI integration can personalize learning experiences to suit individual needs	3.24	Positive Perception
AI-powered analytics can help in tracking students' progress and performance.	3.26	Very Positive Perception
I am open to exploring new ways of learning through AI integration	3.39	Very Positive Perception
Overall Mean	3.35	Very Positive Perception

Legend:

Scale	Range	Descriptive Rating	Qualitative Interpretation
4	3.26-4.00	Strongly Agree	Very Positive Perception
3	2.51-3.25	Agree	Positive Perception
2	1.76-2.50	Disagree	Negative Perception
1	1.00-1.75	Strongly Disagree	Very Negative Perception

Similarly, students' agreement that AI makes learning more engaging and interactive (Mean = 3.34) aligns with the findings of Luckin et al. (2018), who noted that AI-driven platforms enhance student engagement through real-time feedback, simulations, and intelligent tutoring systems. These features are particularly relevant in Science education, where conceptual understanding benefits from interactive approaches.

The strong interest in using AI-powered tools (3.41) and openness to exploring new learning methods (3.39) suggest that students are motivated and receptive to technological innovation. This is consistent with the study of Bond et al. (2020), which found that learners demonstrate positive attitudes toward digital tools that support active and self-directed learning.

Moreover, students perceive AI as a valuable supplement to traditional teaching methods (Mean = 3.39), reinforcing the view that AI is not a replacement but an enhancement to existing pedagogical practices. This is supported by Zawacki-Richter et al. (2019), who concluded that AI integration is most effective when combined with traditional instruction, thereby creating a blended, more flexible learning environment. The perception that AI enhances collaboration and communication (3.33), as well as fosters creativity and innovation (3.37), is aligned with findings from Chassignol et al. (2018), who reported that AI tools enable collaborative learning spaces and promote innovative thinking by allowing students to explore and experiment with ideas more efficiently.

Furthermore, students' belief that AI can track progress and performance (3.26) is supported by Kasneci et al. (2023), who emphasized the role of AI analytics in providing data-driven insights that help monitor student learning and improve academic outcomes. However, the slightly lower mean score for personalization of learning (3.24), although still positive, suggests that some students may not yet fully experience or understand AI's capacity for individualized instruction. This observation is consistent with Ng et al. (2021), who noted that while AI has strong potential for personalization, its effectiveness depends on students' familiarity with and actual exposure to such tools.

Student Challenges

Table 3 presents the level of AI integration in pedagogical practices in Science in terms of student challenges. The overall mean of 3.02, interpreted as Positive Perception, indicates that students generally acknowledge several concerns and difficulties associated with the integration of Artificial Intelligence in learning. This suggests that while AI is viewed positively in terms of awareness and usefulness, students remain cautious about its practical implementation.

Table 3. Level of AI integration in pedagogical practices in Science in terms of Student Challenges

Indicators	**Mean**	**Qualitative Interpretation**
I am concerned about the potential technical difficulties in using AI technologies for learning*	3.36	Very Positive Perception
I am concerned about the potential privacy and data security issues related to AI integration*	3.43	Very Positive Perception
I need adequate training and support to use AI technologies in my academic activities	3.38	Very Positive Perception
AI integration may increase reliance on technology, affecting critical thinking skills*	3.36	Very Positive Perception
There may be resistance to change from traditional teaching methods to AI-driven practices.	3.33	Very Positive Perception
I am concerned about the cost and accessibility of AI technologies for all students*	3.43	Very Positive Perception
I am still determining the long-term impact of AI integration on educational outcomes.	3.44	Very Positive Perception
I worry about the ethical implications of AI- driven decision-making in educational settings*	1.63	Positive Perception
AI technologies may only partially align with students' cultural and contextual needs	3.03	Positive Perception
I am hesitant to embrace AI integration due to uncertainty about its future implications*	1.81	Negative Perception
Overall	3.02	Positive Perception

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Legend:

Scale	Range	Descriptive Rating	Qualitative Interpretation
4	3.26-4.00	Strongly Agree	Very Positive Perception
3	2.51-3.25	Agree	Positive Perception
2	1.76-2.50	Disagree	Negative Perception
1	1.00-1.75	Strongly Disagree	Very Negative Perception

Table 3 presents students' perceptions regarding challenges in AI integration in Science pedagogy. Although the overall mean of 3.02 (Agree), interpreted as Positive Perception, suggests that students generally recognize the challenges associated with AI integration, the results also reveal disagreement with several negative statements in the questionnaire. This indicates that students do not strongly perceive AI integration as ethically problematic or threatening to future educational practices.

A closer examination of the data shows that students agreed that AI technologies may only partially align with students' cultural and contextual needs (3.03, Agree). This means students recognize that some AI tools may not fully address local educational contexts, cultural diversity, or learners' specific needs. This finding supports the study by Kasneci et al. (2023), which emphasized that AI systems should be carefully designed to align with curricular demands and cultural relevance to improve student engagement and educational effectiveness.

However, students strongly disagreed with the negative statement, "I worry about the ethical implications of AI-driven decision-making in educational settings" (1.63, Strongly Disagree). This result indicates that students generally do not perceive ethical concerns as a major barrier to AI integration in Science pedagogy. Students appear confident that AI can be used responsibly in educational settings. This finding is consistent with Bond et al. (2020), who reported that students are often optimistic about the use of AI in learning environments despite other operational concerns. "I am hesitant to embrace AI integration due to uncertainty about its future implications" (1.81, Disagree). This suggests that students are generally open to adopting AI technologies and are not significantly discouraged by uncertainties regarding AI's long-term effects in education. The result reflects students' willingness to explore innovative learning tools and adapt to technological advancements in Science education.

Despite disagreeing with these negative statements, students still acknowledged several practical challenges related to AI integration. Students expressed concern regarding technical difficulties (3.36), privacy and data security issues (3.43), the need for adequate training (3.38), accessibility and cost concerns (3.43), overreliance on technology affecting critical thinking skills (3.36), and resistance to change from traditional teaching methods (3.33). These findings indicate that students' concerns are more focused on implementation and operational issues than on fear of or rejection of AI itself.

The findings reveal that students do not strongly associate AI integration with ethical risks or uncertainty about the future. Instead, they demonstrate openness toward AI adoption while recognizing the need to address practical concerns such as accessibility, training, technical support, and contextual alignment. Therefore, the students' perceptions remain generally positive toward the integration of AI in Science pedagogy.

Summary of Respondents perception level of AI integration

Table 4 presents a summary of respondents' perceptions of AI integration in pedagogical practices in Science, including student awareness, student views, and student challenges. The overall mean of 3.26, interpreted as Very Positive Perception, indicates that students generally hold favorable perceptions toward the integration of Artificial Intelligence in their learning environment. This suggests that students widely recognize AI as a supportive tool in Science education.

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Table 4. Summary of Respondents perception level of AI integration in pedagogical practices in Science

Perception level of AI integration in pedagogical practices in Science	Mean	Qualitative Interpretation
Student Awareness	3.41	Very Positive Perception
Student Views	3.35	Very Positive Perception
Student Challenges	3.02	Positive Perception
Overall	3.26	Very Positive Perception

Legend:

Scale	Range	Descriptive Rating	Qualitative Interpretation
4	3.26-4.00	Strongly Agree	Very Positive Perception
3	2.51-3.25	Agree	Positive Perception
2	1.76-2.50	Disagree	Negative Perception
1	1.00-1.75	Strongly Disagree	Very Negative Perception

The summary in Table 4 shows an overall mean of 3.26, interpreted as Agree/Very Positive Perception, indicating that students generally hold a favorable view of AI integration in Science education. In terms of student awareness, the mean score of 3.41 (Strongly Agree, Very Positive Perception) suggests that students are well-informed about AI technologies and recognize their potential benefits in enhancing learning, improving accessibility, and supporting personalized instruction. This finding is consistent with Zawacki-Richter et al. (2019), who reported that students and educators increasingly view AI as a transformative tool in education, capable of improving teaching quality and facilitating learner-centered approaches.

Similarly, Holmes et al. (2021) emphasized that students' awareness of AI positively affects their engagement and readiness to adopt technology-enhanced learning practices. These studies reinforce the idea that high awareness forms the foundation for effective AI integration, as informed learners are more likely to use AI resources effectively.

For student views, the mean score of 3.35 (Strongly Agree, Very Positive Perception) demonstrates that students perceive AI as a valuable and motivating addition to their academic experiences. They acknowledge that AI can make learning more engaging, interactive, and collaborative, while complementing traditional teaching methods. These perceptions are supported by Luckin et al. (2018), who found that students' positive attitudes toward AI enhance motivation to learn, creativity, and academic performance. Additionally, Bond et al. (2020) emphasized that students who view AI favorably are more likely to adopt AI-powered tools and explore innovative approaches to learning. The results indicate that students recognize AI as an opportunity to enrich their Science learning experiences rather than as a replacement for conventional pedagogy.

Regarding student challenges, the mean score of 3.02 (Agree, Positive Perception) reflects students' awareness of practical, ethical, and technical obstacles associated with AI integration. Students are concerned about issues such as technical difficulties, data privacy, accessibility, and the need for adequate training. This is consistent with the study of Ng et al. (2021), which highlighted that students often require structured guidance and hands-on support to use AI tools effectively. Similarly, Kasneci et al. (2023) stressed the importance of providing equitable access, contextual alignment, and technical support to ensure meaningful AI adoption. The slightly lower scores in this domain suggest that while students remain optimistic about AI, successful implementation depends on addressing these practical and operational challenges.

The overall mean of 3.26 (Agree/Very Positive Perception) indicates that students maintain a favorable, receptive attitude toward AI integration in Science education, with awareness and positive views outweighing concerns about challenges. As noted by Holmes et al. (2021) and Luckin et al. (2018),

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combining student receptivity with adequate training, technical support, and contextualized application ensures that AI contributes meaningfully to learning outcomes.

The narrative of the data shows that Science students perceive AI integration as beneficial, motivating, and conducive to enhanced learning experiences. Their positive awareness and views demonstrate readiness to engage with AI technologies, while acknowledgment of challenges highlights the need for structured support, capacity-building, and contextually relevant implementation strategies. When properly guided, AI has the potential to enhance student motivation, engagement, and academic performance in Science education.

Student's Motivation in Science

Self-Efficacy

Table 5 presents students' motivation in Science in terms of self-efficacy. The overall mean of 3.08, interpreted as High Motivation, indicates that students generally demonstrate a strong level of confidence in their ability to learn and perform well in Science. This suggests that learners believe they can understand science concepts and succeed in related academic tasks despite varying levels of difficulty.

Table 5. Level of Students' Motivation in Science in terms of Self-Efficacy

Indicators	Mean	Qualitative Interpretation
Whether the science content is difficult or easy, I am sure that I can understand it	3.25	High Motivation
I am not confident about understanding difficult science concepts.	2.77	High Motivation
I am sure that I can do well on science tests.	3.14	High Motivation
No matter how much effort I put in, I cannot learn science	3.08	High Motivation
When science activities are too difficult, I give up or only do the easy parts	3.18	High Motivation
Overall	3.08	High Motivation

Legend:

Scale	Range	Descriptive Rating	Qualitative Interpretation
4	3.26-4.00	Strongly Agree	Very High Motivation
3	2.51-3.25	Agree	High Motivation
2	1.76-2.50	Disagree	Low Motivation
1	1.00-1.75	Strongly Disagree	Very Low Motivation

Table 5 presents students' motivation in Science in terms of self-efficacy, reflecting learners' belief in their ability to engage with and master Science content successfully. The overall mean of 3.08, interpreted as Agree/High Motivation, suggests that students generally perceive themselves as capable of understanding and performing well in Science, despite the subject's inherent challenges.

Looking at the indicators, students reported that they are confident in their ability to understand Science content, whether it is difficult or easy (Mean = 3.25), and to perform well on Science tests (Mean = 3.14). These findings are consistent with Bandura's (1997) self-efficacy theory, which emphasizes that students' beliefs about their capabilities strongly influence their motivation, persistence in learning, and achievement. Contemporary studies reinforce this, including Usher & Pajares (2018), who found that higher academic self-efficacy is positively correlated with engagement and achievement in Science subjects.

Some indicators show slightly lower scores, such as the perception of struggling to learn difficult science concepts (Mean = 2.77) and giving up when activities are too difficult (Mean = 3.18). While these means

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remain within the High Motivation range, students occasionally encounter challenges that may affect their persistence, particularly when faced with complex tasks.

This aligns with the findings of Schunk & DiBenedetto (2020), who noted that while students with strong self-efficacy generally persevere, challenging content can temporarily lower confidence and affect engagement unless additional support or scaffolding is provided.

The overall result indicates that students' self-efficacy in Science is positive, meaning they feel capable of mastering Science concepts and performing well, even when some tasks are perceived as difficult. This is supported by Zimmerman (2019), who emphasized that students with high self-efficacy are more likely to adopt effective learning strategies, set goals, and persist in the face of academic challenges.

In the context of AI integration, this high level of self-efficacy is significant because students who believe in their capabilities are more likely to engage meaningfully with AI-enhanced learning tools, applying them to solve problems, conduct experiments, or explore scientific concepts.

Active Learning Strategies

Table 6 presents students' motivation in Science in terms of active learning strategies. The overall mean of 3.42, interpreted as Very High Motivation, indicates that students consistently demonstrate strong engagement in active and meaningful learning processes. This suggests that learners are not passive recipients of information but actively participate in constructing their understanding of Science concepts.

Table 6 presents students' motivation in Science in terms of Active Learning Strategies, reflecting learners' engagement and initiative in taking charge of their own learning. The overall mean of 3.42, interpreted as Strongly Agree/Very High Motivation, indicates that students consistently demonstrate high levels of active engagement in Science learning.

Table 6. Level of Students' Motivation in Science in terms of Active Learning Strategies

Indicators	**Mean**	**Qualitative Interpretation**
When learning new science concepts, I attempt to understand them	3.35	Very High Motivation
When learning new science concepts, I connect them to my previous experiences.	3.39	Very High Motivation
When I do not understand a science concept, I find relevant resources that will help me.	3.48	Very High Motivation
When I do not understand a science concept, I would discuss with the teacher or other students to clarify my understanding	3.44	Very High Motivation
During the learning processes, I attempt to make connections between the concepts that I learn.	3.45	Very High Motivation
Overall	3.42	Very High Motivation

Legend:

Scale	Range	Descriptive Rating	Qualitative Interpretation
4	3.26-4.00	Strongly Agree	Very High Motivation
3	2.51-3.25	Agree	High Motivation
2	1.76-2.50	Disagree	Low Motivation
1	1.00-1.75	Strongly Disagree	Very Low Motivation

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The data show that students actively attempt to understand new Science concepts (Mean = 3.35) and connect them to their prior experiences (Mean = 3.39). This demonstrates that learners not only attend to new information but also integrate it with their existing knowledge, aligning with the constructivist approach to learning. Studies such as Prince (2019) emphasize that active learning strategies, including making connections to prior knowledge, enhance conceptual understanding and long-term retention in Science education.

Moreover, students reported that when they do not understand a concept, they proactively seek relevant resources (Mean = 3.48) or discuss the content with teachers or peers (Mean = 3.44). This reflects a high level of self-directed learning and collaborative engagement, which are key indicators of motivation. Freeman et al. (2018) found that students who employ active learning strategies, including collaborative problem-solving and resource- seeking, achieve higher performance and demonstrate sustained interest in Science subjects.

Additionally, the mean score for making connections between learned concepts during the learning process (Mean = 3.45) suggests that students actively organize and relate knowledge to improve understanding. This is supported by Chi & Wylie (2019), who highlighted that learners who actively make connections between ideas develop deeper conceptual understanding and improved critical thinking skills.

The overall high mean of 3.42 demonstrates that students are not passive recipients of information; rather, they take responsibility for their learning by exploring, discussing, and integrating knowledge. Such motivation indicates that students are well-positioned to benefit from AI-enhanced Science learning tools, as active learners are more likely to interact with adaptive platforms, use AI resources for problem-solving, and sustain engagement even with complex content.

Science Learning Value

Table 7 presents students' motivation in Science in terms of the value of science learning. The overall mean of 3.67, interpreted as Very High Motivation, indicates that students place strong importance on learning Science and recognize its relevance to their personal, academic, and cognitive development. This suggests that learners highly value Science as a meaning.

Table 7 presents students' motivation in Science in terms of Science Learning Value, which reflects learners' perceptions of the importance, relevance, and usefulness of Science in their daily lives and intellectual growth. The overall mean of 3.67, interpreted as Strongly Agree/Very High Motivation, indicates that students recognize the intrinsic value of learning Science and are highly motivated by its meaningful application.ul and useful subject.

Table 7. Level of Students' Motivation in Science in terms of Science Learning Value

Indicators	Mean	Qualitative Interpretation
I think that learning science is important because I can use it in my daily life	3.66	Very High Motivation
I think that learning science is important because it stimulates my thinking	3.69	Very High Motivation
In science, I think that it is important to learn to solve problems.	3.67	Very High Motivation
In science, I think it is important to participate in inquiry activities	3.66	Very High Motivation
It is important to have the opportunity to satisfy my own curiosity when learning science..	3.68	Very High Motivation
Overall	3.67	Very High Motivation

Legend:

Scale	Range	Descriptive Rating	Qualitative Interpretation
4	3.26-4.00	Strongly Agree	Very High Motivation
3	2.51-3.25	Agree	High Motivation
2	1.76-2.50	Disagree	Low Motivation
1	1.00-1.75	Strongly Disagree	Very Low Motivation

The data reveal that students strongly agree that learning Science is important for daily life (Mean = 3.66), stimulates their thinking (Mean = 3.69), and helps them develop problem-solving skills (Mean = 3.67). This demonstrates that students perceive Science as not merely a school subject but as a tool for practical understanding, critical thinking, and cognitive development. This finding is consistent with Linnenbrink-Garcia & Pekrun (2018), who emphasized that recognizing the value and relevance of learning strongly predicts student motivation, engagement, and persistence in academic tasks.

Furthermore, students highlighted the importance of participating in inquiry activities (Mean = 3.66) and satisfying their curiosity (Mean = 3.68). These results suggest that learners are motivated by opportunities for hands-on learning, exploration, and inquiry-based experiences, which align with contemporary science education practices. Hidi & Renninger (2019) noted that students who perceive learning content as valuable are more likely to actively engage in inquiry, demonstrate curiosity, and persist in overcoming learning challenges. The consistently high means across all indicators indicate that students attach significant personal and academic value to learning Science, which translates into sustained interest and engagement. High motivation in this dimension also suggests that students are well-positioned to benefit from AI-enhanced learning environments, where content relevance can be contextualized, adaptive learning can address individual needs, and interactive simulations can deepen understanding. Chen et al. (2021) emphasized that linking science content to real-life applications and problem-solving opportunities enhances students' motivation and engagement, particularly when coupled with technological support.

Performance Goal

Table 8 presents students' motivation in Science in terms of performance goals. The overall mean of 2.39, interpreted as Low Motivation, indicates that students are generally not strongly driven by external or competitive factors in their Science learning. This suggests that learners are less motivated by comparison with others, recognition, or teacher attention.

Table 8. Level of Students' Motivation in Science in terms of Performance Goal

Indicators	Mean	Qualitative Interpretation
I participate in science courses to get a good grade	3.45	Very High Motivation
I participate in science courses to perform better than other students.	2.20	Low Motivation
I participate in science courses so that other students think that I'm smart.	1.96	Low Motivation
Participate in science courses so that the teacher pays attention to me	1.93	Low Motivation
Overall	2.39	Low Motivation

Legend:

Scale	Range	Descriptive Rating	Qualitative Interpretation
4	3.26-4.00	Strongly Agree	Very High Motivation
3	2.51-3.25	Agree	High Motivation

2	1.76-2.50	Disagree	Low Motivation
1	1.00-1.75	Strongly Disagree	Very Low Motivation

Table 8 presents students' motivation in Science in terms of Performance Goal, reflecting the extent to which students are motivated by grades, competition, or recognition from others rather than by intrinsic interest or personal growth. The overall mean of 2.39, interpreted as Disagree/Low Motivation, indicates that students are generally not primarily driven by external performance goals in Science learning.

The data show a mixed pattern across indicators. Students reported a high motivation to participate in Science courses to get a good grade (Mean = 3.45, Strongly Agree/Very High Motivation), suggesting that achieving satisfactory academic results still matters to them. However, they disagreed with indicators related to competition with peers (Mean = 2.20), gaining recognition from others (Mean = 1.96), or attracting teacher attention (Mean = 1.93). This indicates that students are less concerned with outperforming classmates or seeking external validation, prioritizing personal learning and understanding over social comparison or approval.

These findings align with the literature on goal orientation in education. Ames (2019) emphasized that students with low performance-goal orientation focus less on external rewards or competition and more on mastery, engagement, and learning for its own sake. Similarly, Senko, Hulleman, & Harackiewicz (2018) found that students motivated by intrinsic goals—curiosity, understanding, and personal growth—tend to demonstrate greater persistence, deeper learning, and higher satisfaction compared to those primarily driven by performance goals. The low overall motivation in performance goals suggests that while students recognize the importance of grades, they are not primarily motivated by comparison or social recognition, which can foster a healthier, mastery-oriented approach to Science learning.

This is consistent with the earlier findings in Self-Efficacy (Table 5), Active Learning (Table 6), and Science Learning Value (Table 7), where students showed high motivation rooted in personal understanding, engagement, and interest in the relevance of Science. Such intrinsic and mastery-oriented motivation is likely to support sustained engagement and effective use of AI-enhanced learning tools, in which success depends on active participation, problem-solving, and exploration rather than competition.

Achievement Goal

Table 9 presents students' motivation in Science in terms of achievement goals. The overall mean of 3.48, interpreted as Very High Motivation, indicates that students experience strong fulfillment and satisfaction when achieving mastery and success in Science-related tasks. This suggests that learners are highly motivated by personal accomplishment and meaningful learning outcomes.

Table 9. Level of Students' Motivation in Science in terms of Achievement Goal

Indicators	Mean	Qualitative Interpretation
During a science course, I feel most fulfilled when I attain a good score in a test.	3.45	Very High Motivation
During science course, I feel most fulfilled when I feel confident about the content in a science course.	3.53	Very High Motivation
During a science course, I feel most fulfilled when I am able to solve a difficult problem.	3.47	Very High Motivation
During a science course, I feel most fulfilled when the teacher accepts my ideas	3.48	Very High Motivation
During a science course, I feel most fulfilled when other students accept my ideas.	3.46	Very High Motivation
Overall	3.48	Very High Motivation

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Legend

Scale	Range	Descriptive Rating	Qualitative Interpretation
4	3.26-4.00	Strongly Agree	Very High Motivation
3	2.51-3.25	Agree	High Motivation
2	1.76-2.50	Disagree	Low Motivation
1	1.00-1.75	Strongly Disagree	Very Low Motivation

Table 9 presents students' motivation in Science in terms of Achievement Goal, reflecting learners' drive to attain mastery, competence, and recognition through successful performance and problem-solving in Science courses. The overall mean of 3.48, interpreted as Strongly Agree/Very High Motivation, indicates that students are highly motivated to achieve success in Science, particularly through personal mastery, problem-solving, and recognition of their contributions.

The data reveal that students feel most fulfilled when they achieve good test scores (Mean = 3.45), feel confident about the content (Mean = 3.53), and successfully solve difficult problems (Mean = 3.47). These indicators suggest that students value both performance outcomes and competence in mastering Science concepts, reflecting a balanced approach between mastery and achievement motivation. This aligns with Pintrich (2018), who highlighted that achievement-oriented students are motivated by both the desire to demonstrate competence and the satisfaction of mastering challenging tasks.

Moreover, students reported high motivation when their ideas are accepted by teachers (Mean = 3.48) and peers (Mean = 3.46). This reflects the social dimension of achievement motivation, where recognition and validation from educators and classmates reinforce students' engagement and confidence. Kaplan & Maehr (2019) emphasized that students' motivation increases when achievement is coupled with opportunities for meaningful social interaction and acknowledgment of effort.

The overall high motivation in this dimension suggests that students are driven not only by grades but also by personal growth, understanding, and problem-solving accomplishments. This complements the findings from previous dimensions, such as Self-Efficacy, Active Learning, and Science Learning Value, in which students demonstrated strong intrinsic and mastery-oriented motivation. Students' achievement motivation suggests they are well-positioned to benefit from AI-integrated Science learning, as AI tools can provide adaptive challenges, real-time feedback, and opportunities for problem-solving, helping learners attain mastery while reinforcing confidence and engagement.

Learning Environment Simulation

Table 10 presents students' motivation in Science in terms of learning environment stimulation. The overall mean of 3.37, interpreted as Very High Motivation, indicates that students are highly motivated to participate in Science, driven by positive classroom conditions and supportive learning experiences. This suggests that the learning environment plays a significant role in sustaining students' interest and engagement in the subject.

Table 10. Level of Students' Motivation in Science in terms of Learning Environment Simulation.

Indicators	Mean	Qualitative Interpretation
I am willing to participate in this science course because the content is exciting and changeable.	3.43	Very High Motivation
I am willing to participate in this science course because the teacher uses a variety of teaching methods.	3.31	Very High Motivation

I am willing to participate in this science course because the teacher does not put a lot of pressure on me.	3.30	Very High Motivation
I am willing to participate in this science course because the teacher pays attention to me.	3.45	Very High Motivation
I am willing to participate in this science course because it is challenging.	3.37	Very High Motivation
Overall	3.37	Very High Motivation

Legend:

Scale	Range	Descriptive Rating	Qualitative Interpretation
4	3.26-4.00	Strongly Agree	Very High Motivation
3	2.51-3.25	Agree	High Motivation
2	1.76-2.50	Disagree	Low Motivation
1	1.00-1.75	Strongly Disagree	Very Low Motivation

Table 10 presents students' motivation in Science in terms of Learning Environment Simulation, reflecting the extent to which students are motivated by the design, dynamics, and instructional practices within their Science learning environment. The overall mean of 3.37, interpreted as Strongly Agree/Very High Motivation, indicates that students are highly motivated to engage in Science courses that provide stimulating, supportive, and interactive learning environments.

The data show that students are motivated by exciting and dynamic content (Mean = 3.43), variety in teaching methods (Mean = 3.31), and teachers' attention and support (Mean = 3.45). These findings suggest that students value instructional practices that are responsive, interactive, and student-centered, which enhance engagement and learning outcomes. This aligns with Hattie (2018), who highlighted that an effective learning environment, characterized by variety, teacher support, and constructive challenge, significantly boosts student motivation and achievement.

Students also reported high motivation when the teacher avoids excessive pressure (Mean = 3.30) and when the content is challenging (Mean = 3.37). This combination of low-pressure support and meaningful challenge promotes optimal motivation, as students feel safe to explore complex concepts while remaining engaged and confident in their abilities. Research by Fredricks, Blumenfeld, & Paris (2019) indicates that a supportive and stimulating learning environment encourages active participation, curiosity, and persistence in Science education.

The high mean score in this dimension reflects students' readiness to participate fully in Science learning activities and their responsiveness to interactive, varied, and adaptive teaching strategies. In the context of AI integration, such a motivated learning environment complements AI tools that offer simulations, adaptive challenges, and personalized learning paths, fostering deeper engagement and promoting higher-order thinking skills. Chen et al. (2021) highlighted that students are more motivated and achieve better learning outcomes when digital tools are integrated into supportive, interactive, and well-structured learning environments.

Summary of students' motivation in Science

Table 11 presents a summary of respondents' levels of motivation in Science, including self-efficacy, active learning strategies, science learning value, performance goal, achievement goal, and learning environment stimulation. The overall mean of 3.23, interpreted as High Motivation, indicates that students generally demonstrate a strong level of motivation in learning Science. This suggests that learners are actively engaged and positively oriented toward Science learning, particularly in terms of interest, value, and achievement experiences.

Table 11. Summary of Respondents perception level of students' motivation in Science subject.

Perception Level of Students' Motivation in Science Subject	Mean	Qualitative Interpretation
Self-Efficacy	3.08	High Motivation
Active Learning Strategies	3.42	Very High Motivation
Science Learning Value	3.67	Very High Motivation
Performance Goal	2.39	Low Motivation
Achievement Goal	3.48	Very High Motivation
Learning Environment Simulation	3.37	Very High Motivation
Overall	3.23	High Motivation

Legend:

Scale	**Range**	**Descriptive Rating**	**Qualitative Interpretation**
4	3.26-4.00	Strongly Agree	Very High Motivation
3	2.51-3.25	Agree	High Motivation
2	1.76-2.50	Disagree	Low Motivation
1	1.00-1.75	Strongly Disagree	Very Low Motivation

Table 11 presents a summary of students' motivation in Science, encompassing six dimensions: Self-Efficacy, Active Learning Strategies, Science Learning Value, Performance Goal, Achievement Goal, and Learning Environment Simulation. The overall mean of 3.23, interpreted as Agree/High Motivation, indicates that students generally exhibit a high level of motivation in Science, driven largely by intrinsic and mastery-oriented factors.

Looking at individual dimensions, students reported high self-efficacy (Mean = 3.08), suggesting confidence in their ability to understand and succeed in Science tasks. This aligns with Bandura (1997), who highlighted that self-efficacy is a strong predictor of persistence, engagement, and achievement.Students demonstrated very high motivation in Active Learning Strategies (Mean = 3.42), indicating that they actively seek understanding, make connections to prior knowledge, consult resources, and collaborate with peers. This is supported by Freeman et al. (2018) and Chi & Wylie (2019), who emphasized that active engagement fosters deeper understanding, critical thinking, and long-term learning outcomes.

In terms of Science Learning Value (Mean = 3.67), students strongly perceive the relevance and importance of Science in daily life, problem-solving, inquiry, and intellectual curiosity. Linnenbrink-Garcia & Pekrun (2018) found that recognizing the value of learning enhances intrinsic motivation, engagement, and persistence in academic tasks.

Conversely, students reported low motivation in the Performance Goal dimension (Mean = 2.39), suggesting that grades, competition, and external recognition are not primary motivators. This is consistent with research by Senko, Hulleman, & Harackiewicz (2018), indicating that mastery-oriented learners focus on personal growth rather than social comparison.Students exhibited very high Achievement Goal motivation (Mean = 3.48), highlighting their drive to attain competence, solve problems, and receive recognition for their ideas from teachers and peers. This demonstrates a balance between personal mastery and the satisfaction of achieving success, consistent with Pintrich (2018) and Kaplan & Maehr (2019).

Finally, Learning Environment Simulation (Mean = 3.37) reflects students' strong motivation for dynamic, supportive, and interactive learning settings, emphasizing the role of teacher attention, instructional variety, and meaningful challenge. Hattie (2018) and Fredricks, Blumenfeld, & Paris (2019) highlighted that engaging learning environments promote participation, curiosity, and persistence, while Chen et al. (2021) noted that AI-based simulations can further enhance these effects.

The students' motivation in Science is largely intrinsic and mastery-oriented, supported by active,

meaningful learning environments, whereas external performance pressures are less influential. The combination of high self-efficacy, active engagement, appreciation of the value of Science, achievement orientation, and a stimulating learning environment creates a strong foundation for effective AI integration in Science pedagogy, in which personalized, interactive, and adaptive learning experiences can further enhance motivation, engagement, and academic outcomes.

Relationship between student's perception level of Artificial Intelligence (AI) integration in pedagogical approaches.

Table 12 presents the correlation analysis on the relationship between AI integration in pedagogical practices and students' motivation in Science. The results show a correlation coefficient r = 0.450 with a p-value of 0.001, which is statistically significant at the $p < 0.001$ level. This indicates a moderate, positive, and significant relationship between the two variables.

Table 12. Correlation Analysis of The Relationship of AI integration in Pedagogical Practices and Students Motivation in Science

AI integration in Pedagogical Practices	r-value	p-value	Interpretation	Decision
Students Motivation in Science	.450	.001	Significant	accept the alternative hypothesis

Table 12 presents the correlation analysis between AI integration in pedagogical practices and students' motivation in Science. The results revealed a correlation coefficient ($r = 0.450$) with a p-value of 0.001, which is significant at the $p < 0.001$ level. This indicates a positive, and statistically significant relationship between AI integration and students' motivation in Science.

The findings suggest that increased perceived integration of Artificial Intelligence in Science instruction is associated with higher levels of student motivation. This implies that AI-supported instructional practices may enhance students' engagement, interest, and willingness to participate in learning activities. This supports the idea that technology-enhanced learning environments contribute to more meaningful and interactive classroom experiences. In relation to prior studies, Fatima and Khawar (2025) emphasized that AI-supported learning environments improve student motivation and engagement by providing personalized and adaptive learning experiences. Similarly, Chávez Benavides et al. (2025) found that AI-driven instruction positively influences student performance and motivation when learning activities are aligned with learners' needs and abilities. Moreover, Merino-Campos (2025) highlighted that AI integration in education enhances learner-centered instruction, which promotes active participation and deeper understanding of concepts.

However, the moderate correlation also suggests that AI integration is not the only determinant of students' motivation. Other factors such as teaching strategies, classroom environment, and learner characteristics may also significantly influence motivation levels. The results confirm that AI integration in pedagogical practices is positively and meaningfully associated with students' motivation in Science, supporting its role as an effective educational tool when properly implemented in classroom instruction.

SUMMARY, CONCLUSION AND RECOMMENDATIONS

This chapter presents the summary of the study's findings, conclusions, and recommendations.

Summary of Findings

Findings revealed that students have a very positive perception of AI integration, particularly in terms of awareness (M = 3.41) and views (M = 3.35). In contrast, challenges (M = 3.02) were perceived positively, but they do not strongly view AI integration as ethically problematic or threatening to future educational practices. Overall, AI integration was rated high (M = 3.26).

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In terms of motivation, students demonstrated very high motivation in most areas, especially in science learning value (M = 3.67), achievement goal (M = 3.48), active learning strategies (M = 3.42), and learning environment simulation (M = 3.37). However, the performance goal (M = 2.39) was low, indicating that students are less driven by external rewards and competition. Overall motivation was high (M = 3.23).

The results revealed a correlation coefficient ($r = 0.450$) with a p-value of 0.001, which is significant at the $p < 0.001$ level. This indicates a positive, and statistically significant relationship between AI integration and students' motivation in Science.

Conclusions

Based on the findings of the study, the following conclusions were drawn:

The students perceived the integration of Artificial Intelligence (AI) in pedagogical practices in Science as highly positive. Students' perceptions of awareness and views are very positive, while students' challenges are perceived positively. The students had a high motivation in Science. In terms of active learning strategies, science learning value, achievement goal, and learning environment stimulation, they have a very high level. The self-efficacy was also high, while the performance goal has a low motivation level.

Furthermore, the study found a significant positive relationship between students' perceived AI integration and their motivation in Science. Therefore, the study's alternative hypothesis is accepted.

Recommendations

In light of the findings and conclusions, the following recommendations are proposed:

For Science teachers, it may be beneficial to consider integrating selected AI tools, such as adaptive quizzes, simulation apps, or AI-assisted feedback systems, to support lesson delivery and make concepts more interactive and easier to understand. Teachers may also provide guided orientation or short demonstrations to help students become more comfortable in using these tools during learning activities. For School Administrators, it is recommended that schools consider strengthening support mechanisms for AI integration by providing access to reliable digital tools, stable internet connectivity, and periodic training sessions focused on practical classroom applications of AI in Science instruction. For Curriculum Developers: The inclusion of AI-supported learning tasks, such as inquiry-based activities using digital simulations or data analysis tools, may be considered in Science curricula to align lessons with current educational technologies and promote more engaging learning experiences. Students may be encouraged to explore AI-based learning platforms as supplementary study tools, particularly for reviewing lessons, practicing problem-solving, and conducting independent research to support their Science learning.

Future researchers may conduct further studies to explore related areas, such as the impact of AI integration on specific academic skills in Science, differences across grade levels, or comparative studies between AI-assisted and non-AI-assisted learning environments, using more varied research designs, such as experimental or longitudinal approaches.

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APPENDICES

Appendix A. Letter to the College Dean for Pilot Testing

Appendix B. Letter of Request to Conduct the Study

Appendix C. Letter of Permission to the author to adapt questionnaire

Appendix C. Continued

Appendix D. Letter of the Cooperating Teacher

Appendix E. Respondents Note Approval

Appendix F. Survey Questionnaire

20 Done

Republic of the Philippines
PROVINCE OF BUKIDNON
Municipality of Don Carlos
DON CARLOS POLYTECHNIC COLLEGE
Purok 2, Poblacion Norte, Don Carlos, Bukidnon

Name (Optional): _____
School: Don Carlos Polytechnic College
Part I. Respondents Characteristics
Instruction: Please check (/) the appropriate box that corresponds your Choice:
Please indicate how strongly you agree with each of the following statements.

Scale: 4- Strongly Agree, 3- Agree, 2 - Disagree, 1 - Strongly Disagree

Year Level:
☑ First Year ☐ Second Year ☐ Third Year

Part II. Perception level on AI integration

A. Students Awareness

Statements	4	3	2	1
1. I am aware of the potential benefits of using AI technologies in education		/		
2. I understand how AI technologies can improve the quality of education.		/		
3. I am familiar with the various applications of AI in educational settings		/		
4. I am confident in my knowledge about the potential of AI technologies in education.		/		
5. AI can facilitate adaptive learning, catering to individual student needs		/		
6. I believe AI can contribute to improving accessibility and inclusivity in education.		/		
7. AI technologies can provide personalised learning experiences.		/		
8. AI-powered tutoring systems can supplement traditional classroom instruction.		/		
9. AI can assist in identifying students' learning gaps and providing targeted interventions.		/		
10. I am interested in learning more about the role of AI in education.	/			

B. Students Views

Statements	4	3	2	1
1. Integrating AI technologies into academic activities can enhance learning experiences		/		
2. AI integration can make learning more engaging and interactive		/		
3. I am interested in using AI-powered tools and resources for my academic tasks		/		
4. AI integration is a valuable addition to traditional teaching methods.		/		
5. AI technologies can enhance collaboration and communication among students		/		
6. I am excited about the potential of AI to enhance my academic performance.		/		
7. AI technologies can foster creativity and innovation in academic projects.		/		
8. AI integration can personalise learning experiences to suit individual needs		/		
9. AI-powered analytics can help in tracking students' progress and performance.		/		
10. I am open to exploring new ways of learning through AI integration		/		

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Part III. Level of Students Motivation

C. Students Challenges

Statements	4	3	2	1
1. I am concerned about the potential technical difficulties in using AI technologies for learning		✓		
2. I am concerned about the potential privacy and data security issues related to AI integration		✓		
3. I need adequate training and support to use AI technologies in my academic activities		✓		
4. AI integration may increase reliance on technology, affecting critical thinking skills		✓		
5. There may be resistance to change from traditional teaching methods to AI-driven practices.		✓		
6. I am concerned about the cost and accessibility of AI technologies for all students.		✓		
7. I am still determining the long-term impact of AI integration on educational outcomes.		✓		
8. I worry about the ethical implications of AI-driven decision-making in educational settings.		✓		
9. AI technologies may only partially align with students' cultural and contextual needs		✓		
10. I am hesitant to embrace AI integration due to uncertainty about its future implications.		✓		

A. Self Efficacy

Statements	4	3	2	1
1. Whether the science content is difficult or easy, I am sure that I can understand it		✓		
2. I am not confident about understanding difficult science concepts.		✓		
3. I am sure that I can do well on science tests.			✓	
4. No matter how much effort I put in, I cannot learn science			✓	
5. When science activities are too difficult, I give up or only do the easy parts			✓	

B. Active Learning Strategies

Statements	4	3	2	1
1. When learning new science concepts, I attempt to understand them.		✓		
2 When learning new science concepts, I connect them to my previous experiences.		✓		
3. When I do not understand a science concept, I find relevant resources that will help me.		✓		
4. When I do not understand a science concept, I would discuss with the teacher or other students to clarify my understanding		✓		
5.During the learning processes, I attempt to make connections between the concepts that I learn.		✓		

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Science Learning Value

Statements	4	3	2	1
1. I think that learning science is important because I can use it in my daily life.		✓		
2. I think that learning science is important because it stimulates my thinking.		✓		
3. In science, I think that it is important to learn to solve problems.		✓		
4. In science, I think it is important to participate in inquiry activities.		✓		
5. It is important to have the opportunity to satisfy my own curiosity when learning science.		✓		

D. Performance Goal

Statements	4	3	2	1
1. I participate in science courses to get a good grade		✓		
2. I participate in science courses to perform better than other students.			✓	
3. I participate in science courses so that other students think that I'm smart.			✓	
4. participate in science courses so that the teacher pays attention to me			✓	

E. Achievement Goal

Statements	4	3	2	1
1. During a science course, I feel most fulfilled when I attain a good score in a test.		✓		
2. feel most fulfilled when I feel confident about the content in a science course.		✓		
3. During a science course, I feel most fulfilled when I am able to solve a difficult problem.		✓		
4. During a science course, I feel most fulfilled when the teacher accepts my ideas		✓		
5. During a science course, I feel most fulfilled when other students accept my ideas.		✓		

F. Learning Environment Stimulation

Statements	4	3	2	1
1. I am willing to participate in this science course because the content is exciting and changeable.		✓		
2. am willing to participate in this science course because the teacher uses a variety of teaching methods..		✓		
3. I am willing to participate in this science course because the teacher does not put a lot of pressure on me.		✓		
4. I am willing to participate in this science course because the teacher pays attention to me.		✓		
5 I am willing to participate in this science course because it is challenging.		✓		

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