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AI In Education: Students Engagement and Achievement

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ABSTRACT

This study examined the relationship between the use of Artificial Intelligence (AI) tools and students' engagement and academic achievement among high school students at Don Carlos Ledesma National High School during the School Year 2025–2026. Specifically, it determined the extent of AI tool usage, assessed students' engagement across affective, cognitive, and psychomotor domains, and evaluated their academic performance. A correlational quantitative research design was employed, involving 278 students selected through proportionate stratified random sampling. Data were collected using a researcher-developed questionnaire and analyzed using descriptive statistics (mean and standard deviation) and the Pearson Product–Moment Correlation Coefficient. The findings revealed that students utilized AI tools to a great extent (M = 3.58, SD = 0.480) and demonstrated high levels of engagement (M = 3.68, SD = 0.423) and academic performance (M = 3.54, SD = 0.589). However, the results indicated no statistically significant relationship between the extent of AI use and overall student engagement (r = -0.028, p = 0.642), suggesting that AI utilization does not significantly relate to students' level of engagement. These findings imply that although AI tools are widely used and students exhibit high engagement and academic performance, AI use alone does not predict or significantly influence these outcomes. Therefore, the study recommends that educators adopt structured and purposeful integration of AI tools aligned with instructional objectives to better support meaningful learning experiences.

Keywords: Academic achievement, artificial Intelligence, high school students, secondary education, student engagement

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INTRODUCTION

The rapid advancement of Artificial Intelligence (AI) has reshaped the educational landscape by introducing new ways of teaching and learning. AI tools such as ChatGPT, Cici, Gemini, and Bard are now widely used by students to access information, receive feedback, and support academic tasks. Their growing presence in classrooms calls for a clearer understanding of how these technologies relate to key learning outcomes, particularly student engagement and academic performance.

AI integration in education offers instructional support through features such as automated feedback, adaptive learning, and access to immediate information, which can influence how students participate in and experience learning. At the same time, its use requires careful implementation to ensure that it supports, rather than replaces, essential cognitive processes. These considerations emphasize the importance of examining AI use within actual classroom contexts rather than relying solely on assumed benefits.

Student engagement and academic achievement remain central indicators of effective learning. In this study, student engagement is examined across three domains—affective, cognitive, and psychomotor—which capture students' emotional involvement, mental effort, and active participation. Together with academic achievement, these variables provide a comprehensive basis for evaluating how AI tools relate to students' learning experiences and outcomes.

Previous studies have reported positive associations between AI-assisted learning and student outcomes, including improved motivation, participation, and academic performance (Villaver & Cabigas, 2022; Medrano et al., 2025; Prestoza & Banatao, 2023; Milloria et al., 2024). However, these studies are often limited in scope, focusing on specific platforms or conducted in urban settings, which may not fully represent the experiences of students in other contexts.

Despite these findings, there remains a lack of localized and comprehensive evidence on how the extent of AI tool usage relates to student engagement and academic achievement, particularly among senior high school students in San Carlos City, Negros Occidental. Moreover, existing studies often examine single AI tools rather than the combined use of multiple platforms, which is more reflective of actual student practices. These gaps raise an important question: does the extent of AI tool usage significantly relate to students' engagement across affective, cognitive, and psychomotor domains, as well as to their academic achievement?

In response to these gaps, this study aims to examine the relationship between AI tool usage and student engagement—affective, cognitive, and psychomotor—as well as academic achievement among senior high school students in San Carlos City. By addressing these specific gaps, the study seeks to provide context-based evidence that can guide educators, school administrators, and policymakers in making informed decisions regarding the integration of AI in teaching and learning.

OBJECTIVES OF THE STUDY

This study aimed to investigate the relationship between the use of Artificial Intelligence (AI) tools and students' engagement and academic achievement. Specifically, it sought to answer the following questions:

1. What is the extent of AI tool usage among students?
2. What is the level of students' engagement when using AI tools in education in terms of:
    a. Affective engagement
    b. Cognitive engagement
    c. Psychomotor engagement
3. What is the level of students' academic achievement when using AI tools in education?
4. Is there a significant relationship between the extent of AI tool usage and students' engagement?
5. Is there a significant relationship between the extent of AI tool usage and students' academic achievement?
6. Based on the findings of the study, what recommendations may be proposed to improve the integration of AI tools in education?

LITERATURE REVIEW

This section presents relevant local and international literature and studies related to Artificial Intelligence (AI), student engagement, and academic performance. It provides both theoretical and empirical foundations by critically examining existing findings, identifying consistencies and contradictions, and establishing research gaps that justify the present study.

Artificial Intelligence in Education

Artificial Intelligence (AI) has emerged as a transformative tool in education, enabling adaptive learning, intelligent tutoring, and automated assessment. While numerous studies report that AI enhances learning efficiency through real-time feedback and personalized instruction, the extent of its effectiveness remains debated. Some researchers argue that AI significantly improves learning outcomes and student motivation, while others emphasize that its impact is highly dependent on context, implementation, and user behavior.

For instance, recent studies (2020–2025) consistently highlight AI's capacity to support differentiated instruction and improve access to information. However, contrasting findings indicate that excessive reliance on AI tools may reduce students' independent thinking and problem-solving skills. This divergence suggests that AI is not inherently beneficial or detrimental; rather, its educational value depends on how it is integrated into the learning process. These differing perspectives highlight the need to examine AI use not only in terms of availability but also in relation to measurable student outcomes such as engagement and academic performance.

Theoretical Foundations of AI in Learning

The role of AI in education can be better understood through established learning theories. Constructivism posits that learners actively construct knowledge through interaction and experience, which aligns with AI's capability to provide interactive and adaptive learning environments. However, critics argue that over-automation may limit opportunities for deep cognitive processing if learners become passive recipients of AI-generated responses.

Similarly, Connectivism emphasizes learning through digital networks, where AI tools act as information nodes. While this supports access to vast knowledge sources, some scholars question whether such dependence weakens students' ability to critically evaluate information. Meanwhile, Self-Determination Theory (SDT) explains engagement through autonomy, competence, and relatedness. Although AI can support these needs through personalization and feedback, studies show inconsistent results regarding whether these features translate into sustained engagement. These theoretical perspectives collectively suggest that AI has the potential to enhance learning, but its actual impact must be empirically validated.

Student Engagement

Student engagement is widely recognized as a multidimensional construct encompassing affective, cognitive, and psychomotor domains. Existing literature consistently identifies engagement as a strong predictor of academic success. However, a critical review of studies reveals that most research tends to emphasize behavioral or observable engagement, often neglecting the affective and cognitive dimensions.

While several studies report that AI-supported environments increase student participation and motivation, others argue that engagement may be superficial if driven primarily by convenience rather than genuine cognitive investment. This indicates a gap in understanding how AI use relates to deeper forms of engagement, particularly across all three domains. Therefore, examining engagement as a multidimensional variable is necessary to provide a more comprehensive assessment of AI's role in learning.

Academic Performance

Academic performance is commonly associated with measurable outcomes such as grades and mastery of competencies. Many studies suggest a positive relationship between technology use and academic achievement, including AI-assisted learning. However, findings are not universally consistent.

Some research demonstrates that AI improves academic performance by offering immediate feedback and personalized support, while other studies report minimal or no significant effects when controlling for other variables such as prior knowledge, learning strategies, and teacher support. These inconsistencies indicate that academic performance cannot be attributed solely to AI usage. Instead, it is influenced by a combination of factors, highlighting the importance of examining AI use as one of several contributing variables rather than a direct determinant of achievement.

Challenges and Best Practices in AI Integration

The integration of AI in education presents both opportunities and challenges. While AI can enhance instructional delivery, concerns regarding academic integrity, data privacy, and digital inequality persist. More importantly, studies differ in their conclusions regarding best practices. Some researchers advocate for extensive AI integration to maximize learning benefits, while others emphasize the need for controlled and guided use to prevent overdependence. There is general agreement, however, that teacher facilitation and pedagogical alignment are critical factors in ensuring effective AI use. This consensus reinforces the idea that technology alone does not guarantee improved learning outcomes

Synthesis of the Reviewed Literature

The reviewed literature demonstrates general agreement that AI has the potential to support student engagement and academic performance through personalization, feedback, and interactive learning experiences. However, critical analysis reveals inconsistencies in empirical findings, particularly regarding the strength and significance of these relationships.
While some studies report positive correlations between AI use and student outcomes, others show limited or no significant effects, suggesting that the relationship is not straightforward. Additionally, many studies focus on single AI platforms or are conducted in higher education and urban contexts, limiting their applicability to secondary school settings and local environments.

These gaps are directly related to the variables of the present study—AI tool usage, student engagement (affective, cognitive, and psychomotor), and academic performance. Specifically, there is a need to examine whether the extent of AI use is significantly related to multidimensional engagement and academic achievement within a localized context.
Therefore, this study addresses these gaps by investigating the relationship between AI tool usage and student outcomes among high school students in San Carlos City. By doing so, it provides a more contextualized and comprehensive understanding of AI's role in education and contributes to clarifying inconsistencies in existing literature.

METHODOLOGY

This section presents the research design, respondents of the study, research instruments, validity and reliability of the instrument, data collection procedure, data analysis, and ethical considerations. Each section explains how the study was conducted to ensure accuracy, reliability, and credibility of the findings.

Research Design

This study employed a **quantitative correlational research design** to examine the relationship between students' use of Artificial Intelligence (AI) tools and two outcome variables: student engagement and academic achievement. The correlational approach was appropriate because the study aimed to determine the degree of relationship among variables without manipulating them.
Data were collected using a structured questionnaire designed to measure the extent of AI tool usage, levels of engagement (affective, cognitive, and psychomotor), and academic achievement. Descriptive statistics were used to summarize the variables, while inferential statistics, particularly Pearson Product–Moment Correlation, were applied to determine the relationships among them.

Respondents of the Study

The respondents of this study were the high school students enrolled at Don Carlos Ledesma National High School, Brgy. Buluangan, San Carlos City, Negros Occidental during the 2025–2026 school year. To be eligible, students had to be currently enrolled in their respective grade level and able to provide parental consent (for minors) along with student assent. Students were excluded if they had extended absences during data collection or were unable to complete the questionnaire. All participants were assured that their responses would remain anonymous and confidential and that they could withdraw from the study at any time without penalty.

Table 1 presents the distribution of the population and sample across grade levels and sections. Using proportionate stratified random sampling, a representative sample of 278 students was selected from the total population of 996, with the number of respondents from each section determined according to enrollment size to ensure fair representation.

Table 1

Population and Sample Distribution by Grade Level and Section

Grade Level & Section	Population	Sample
Grade 7 – Einstein	34	9
Grade 7 – Earth	40	11
Grade 7 – Mercury	42	12
Grade 7 – Jupiter	43	12
Grade 7 – Uranus	44	12
Grade 7 – Neptune	46	13
Grade 7 – Saturn	42	12
Grade 8 – Newton	30	8
Grade 8 – Hyacinth	45	13
Grade 8 – Cattleya	37	10
Grade 8 – Sunflower	40	11
Grade 8 – Magnolia	39	11
Grade 8 – Daisy	38	11
Grade 9 – Galilei	29	8
Grade 9 – Jade	39	11
Grade 9 – Emerald	39	11
Grade 9 – Diamond	38	11
Grade 9 – Sapphire	39	11
Grade 9 – Amethyst	39	11
Grade 10 – STE Curie	24	7
Grade 10 – Gemini	42	12
Grade 10 – Aquarius	37	10
Grade 10 – Aries	37	10
Grade 10 – Capricorn	37	10
Grade 10 – Pisces	34	9
Grade 10 – Taurus	42	12
Total	**996**	**278**

Research Instruments

To investigate the extent of students' use of AI tools and its correlation with their engagement and academic achievement, this study utilized a researcher-developed structured questionnaire as the primary data collection instrument. The questionnaire was designed to capture three main constructs: (1) the extent of AI tool use (including frequency, types of tools used, and purposes of use), (2) student engagement while using AI tools, and (3) academic achievement in relation to AI use. Items were formulated based on relevant literature and aligned with the objectives of the study to ensure content validity.

The instrument employed Likert-scale items across all sections. The AI usage section measures how frequently students use various AI tools (e.g., ChatGPT, Grammarly, AI-driven tutoring systems) for academic tasks such as writing, studying, problem-solving, or organizing tasks. The engagement component evaluates students' affective, cognitive, and psychomotor engagement specifically in the context of AI-assisted learning activities. Similarly, the academic achievement section used Likert-scale items to measure students' perceived performance in relation to AI use. While self-reported measures are commonly used in educational research, they may be subject to response bias. Thus, the results related to academic achievement should be interpreted with caution, and future studies are encouraged to incorporate objective measures such as grades or GPA to strengthen validity. The instrument uses 10 questions per factor to ensure comprehensive coverage of each construct, improve reliability, strengthen construct validity, and support robust statistical analysis. Methodological literature recommends 8–12 items per factor for reliable and valid measurement (DeVellis, 2016; Henson & Roberts, 2006; Tavakol & Dennick, 2011), making 10 items appropriate for this study.

Validity of the Research Instrument

The research instrument used in this study consisted of fifty items divided across four main parts. Part I measured the extent of AI use, Part II measured students' engagement subdivided into affective, cognitive, and psychomotor domains, and Part III measured academic performance, with each part originally containing ten items. To ensure that the instrument accurately represented the intended constructs, content validity was evaluated using Lawshe's Content Validity Ratio (CVR).

A panel of nine experts assessed each item and classified them as essential, useful but not essential, or not necessary. Items with a CVR below the minimum acceptable value of 0.78 were considered insufficiently representative of the construct. Based on this evaluation, one item in Part IIb (Cognitive Engagement) was removed due to a low CVR, resulting in a final instrument of forty-nine items. Following this adjustment, the Average Content Validity Ratio (A-CVR) was computed for the overall instrument, yielding a value of 0.914. This indicates strong content validity and confirms that the final instrument is appropriate for measuring students' engagement, academic performance, and extent of AI use in the context of AI-enhanced learning.

The content validation process ensured that each part of the instrument accurately captured the intended dimension. Part I assesses students' frequency and degree of AI tool utilization in learning activities. Part II evaluates students' engagement across affective, cognitive, and psychomotor domains, reflecting motivation, critical thinking, and practical participation in learning tasks. Part III measures academic performance in terms of perceived achievement, task accuracy, and learning outcomes. The high A-CVR demonstrates that the instrument is both comprehensive and representative, providing a valid basis for the collection and interpretation of data in this study.

Reliability of the Research Instrument

The reliability of the research instrument was assessed to determine the consistency and stability of the measurement across its items. Cronbach's alpha was used as the reliability coefficient, as it is widely accepted for evaluating internal consistency in quantitative instruments. The computed Cronbach's alpha values for each part were 0.791, 0.787, 0.825, 0.814, and 0.920, indicating acceptable to excellent internal consistency for all sections. The overall reliability of the entire instrument was calculated to be 0.953, demonstrating very high consistency across all items.

These results confirm that the instrument is reliable and suitable for measuring students' engagement, academic performance, and extent of AI use in AI-assisted learning environments. The high reliability provides confidence that the data collected accurately reflect the constructs under study and ensures that the instrument can consistently measure these variables across different respondents.

Data Gathering Procedure

The data collection followed a systematic process:

1. Permission was secured from school authorities.
2. Informed consent and assent were obtained from participants.
3. The questionnaire was administered to selected respondents.
4. Completed questionnaires were collected and checked for completeness.
5. Data were organized and prepared for analysis.

All procedures were conducted in accordance with ethical standards, ensuring voluntary participation and confidentiality.

Data Analysis

Data were analyzed using the Statistical Package for the Social Sciences (SPSS).

Descriptive statistics, including **mean and standard deviation**, were used to summarize the extent of AI use, student engagement, and academic achievement. Verbal interpretation scales were used to describe the levels of each variable.

Inferential statistics were applied using **Pearson Product–Moment Correlation** to examine relationships between:

- AI tool usage and student engagement
- AI tool usage and academic achievement

Table 2

Verbal Interpretation of Mean Scores – Extent of AI Use

Mean Range	Verbal Interpretation
4.21 – 5.00	Very Great Extent
3.41 – 4.20	Great Extent
2.61 – 3.40	Moderate Extent
1.81 – 2.60	Slight Extent
1.00 – 1.80	No Extent

Table 3

Interpretation of Mean Scores – Level of Engagement and Academic Performance

Mean Range	Verbal Interpretation
4.21 – 5.00	Very High
3.41 – 4.20	High
2.61 – 3.40	Moderate
1.81 – 2.60	Low
1.00 – 1.80	Very Low

For descriptive analysis, the mean and standard deviation for each item were computed. The results were presented in tables to summarize the overall patterns of AI use, engagement, and academic performance among students. Specifically, the extent of AI use was summarized in Table 4, while students' engagement was reported in three separate tables corresponding to the affective, cognitive, and psychomotor domains (Tables 5 to 7). A combined overall engagement score was presented in Table 8. Academic performance was summarized in Table 9. Each table includes the mean, SD, and verbal interpretation of the items, allowing a clear understanding of the levels of AI use, engagement, and achievement among respondents. The verbal interpretation columns in these tables are based on the scales provided in Tables 2 and 3.

To examine the relationships among the variables, Pearson Product–Moment Correlation was applied using the mean scores of the items for each construct. Prior to conducting the correlation analysis, the normality of the data was tested using the Kolmogorov-Smirnov test due to the large sample size ($n > 200$). The results indicated non-normality ($p = 0.000$) for all

variables. However, the use of composite mean scores derived from multiple Likert-scale items approximates interval-level measurement. In addition, the Central Limit Theorem supports that, in large samples, the sampling distribution of the mean approaches' normality, thereby justifying the use of parametric tests such as Pearson correlation.

To further strengthen the analysis, Spearman Rank-Order Correlation was also considered as a non-parametric alternative to verify the consistency of the results. The use of both Pearson and Spearman correlation provides a more robust assessment of the relationships among variables, particularly when assumptions of normality are not fully met.

Correlation coefficients (r) were interpreted using standard guidelines, and statistical significance was set at $p < 0.05$. Positive values indicate a direct relationship, while negative values indicate an inverse relationship.

In summary, the data analysis procedure combined descriptive statistics, including mean, SD, and verbal interpretation, to report the extent of AI use, students' engagement, and academic performance. Inferential statistics using Pearson correlation were employed to examine the relationships between AI use and the other key constructs. The use of verbal interpretation tables ensured a clear and uniform reporting method, while the justification for Pearson correlation, including reference to the Central Limit Theorem, provided a defensible approach for analyzing the relationships between variables. This procedure ensured a systematic and consistent approach for addressing all research questions and interpreting the data in a meaningful and academically rigorous manner.

Ethical Considerations

Ethical standards were strictly observed throughout the study. Participants were informed about the purpose of the research and their right to withdraw at any time without penalty. Participation was voluntary.

Confidentiality and anonymity were ensured by not collecting identifying information and by using the data solely for research purposes. All participants were treated with respect, fairness, and integrity in accordance with ethical research guidelines.

RESULTS AND DISCUSSION

This section presents and interprets the findings of the study based on the data collected from the respondents. The results are organized according to the sequence of the research questions to ensure clarity and coherence. Statistical findings are presented first, followed by interpretation and comparison with related studies. All results are reported in the past tense.

Table 4

Extent of AI Use Among Students (n=278)

Item	Mean	SD	Verbal Interpretation
1. Lesson Understanding	3.56	0.632	Great Extent
2. Assignment Assistance	3.55	0.799	Great Extent
3. Concept Explanation	3.55	0.748	Great Extent
4. Idea/Outline Generation	3.51	0.787	Great Extent
5. Writing Improvement	3.58	0.720	Great Extent
6. Review/Exam Prep	3.59	0.763	Great Extent
7. Material Summarization	3.62	0.777	Great Extent
8. Problem Solving	3.66	0.723	Great Extent
9. Extra Exploration	3.64	0.712	Great Extent
10. Study Routine Integration	3.54	0.645	Great Extent
Overall Extent of AI Use	**3.58**	**0.480**	**Great Extent**

The results revealed that students used AI tools to a **great extent**, with an overall mean of 3.58 (SD = 0.480). All indicators, including lesson understanding, assignment assistance, writing improvement, and problem solving, were rated within the "great extent" range. This indicates that students frequently integrated AI tools into their academic tasks and daily learning routines.

These findings suggest that AI has become a regular part of students' learning practices. The consistent use of AI tools may support independent learning, quick access to information, and task efficiency. This supports previous studies which found that AI use is associated with increased participation, motivation, and interaction with learning materials (Chaudhary et al., 2024; Al Mashagbeh et al., 2025).

However, while the high level of usage reflects accessibility and acceptance of AI tools, it also highlights the need for proper guidance. Without structured use, students may rely on AI without fully developing critical thinking skills. Thus, AI should be integrated with clear instructional strategies to maximize its benefits.

Table 5

Level of Affective Engagement Among Students (n=278)

Item	Mean	SD	Verbal Interpretation
1. Motivation to Learn	3.28	0.780	Moderate
2. Enjoyment in Learning	3.38	0.862	Moderate
3. Confidence in Participation	3.32	0.879	Moderate
4. Connection to Learning Content	3.49	0.823	High
5. Curiosity to Explore	3.52	0.840	High
6. Reduced Stress	3.60	0.928	High
7. Motivation to Engage in AI Tasks	3.31	0.883	Moderate
8. Increased Interest in Subjects	3.51	0.930	High
9. Sense of Accomplishment	3.46	0.881	High
10. Encouraged to Express Ideas	3.41	0.869	Moderate
Overall Affective Engagement	**3.43**	**0.585**	**High**

The results showed an overall mean of 3.43 (SD = 0.585), interpreted as **high**. Students reported positive emotional responses such as curiosity, reduced stress, and increased interest in learning. However, some indicators, including motivation, enjoyment, and confidence, were rated as moderate.

This suggests that while AI tools generally promote positive emotions toward learning, they do not fully sustain motivation for all students. These findings align with studies indicating that AI can enhance emotional engagement, particularly when it provides autonomy and interactive learning experiences (Yin et al., 2024).

The results imply that AI tools can support students' emotional connection to learning, but teacher guidance remains essential. Combining AI use with collaborative and interactive activities may further strengthen motivation and confidence.

Table 6

Level of Cognitive Engagement Among Students (n=278)

Item	Mean	SD	Verbal Interpretation
1. AI helps understand difficult concepts	3.84	0.822	High
2. Plan and organize learning activities	3.65	0.836	High
3. Spend more time thinking critically	3.38	0.814	Moderate
4. Actively try to understand lessons better	3.46	0.817	High
5. Analyze and evaluate information effectively	3.56	0.842	High
6. Explore new learning strategies	3.61	0.867	High
7. Feel focused and attentive	3.34	0.816	Moderate

Table 6

Level of Cognitive Engagement Among Students (n=278)

Item	Mean	SD	Verbal Interpretation
8. Motivated to solve complex problems independently	3.51	0.844	High
9. Connect new knowledge with prior knowledge	3.63	0.852	High
Overall Cognitive Engagement	**3.55**	**0.526**	**High**

The overall mean of 3.55 (SD = 0.526) indicated a **high level of cognitive engagement**. Students demonstrated strong abilities in understanding difficult concepts, organizing learning tasks, and connecting new knowledge with prior learning. However, critical thinking and sustained focus were rated as moderate.

These findings indicate that AI tools support comprehension and strategic learning but may not consistently promote deeper analytical thinking. This supports research showing that AI enhances cognitive engagement when used for problem solving and information processing (Wang & Guo, 2025).

The results highlight the importance of designing AI-supported tasks that encourage critical thinking, reflection, and analysis. Without such strategies, students may rely on AI outputs without deeper understanding.

Table 7

Level of Psychomotor Engagement Among Students (n=278)

Item	Mean	SD	Verbal Interpretation
Task Execution Using AI Tools	4.30	0.649	High
Active Participation in AI-Based Activities	4.46	0.573	High
Technical Skill in Using AI Tools	4.44	0.571	High
Application of Learning Through AI	4.48	0.568	High
Independent and Strategic Use of AI	4.46	0.561	High
Overall	**4.43**	**0.293**	**High**

Students demonstrated a **high level of psychomotor engagement**, with an overall mean of 4.43 (SD = 0.293). All indicators, including task execution, technical skills, and application of learning, were rated high.

This suggests that students were able to actively perform tasks, use AI tools effectively, and apply their learning in practical situations. The high scores indicate strong observable engagement in AI-supported activities.

These findings are consistent with studies showing that AI tools improve task performance, technical skills, and hands-on learning (Computers & Education, 2024). The results emphasize that AI is particularly effective in supporting action-based and performance-oriented learning.

Table 8

Overall Engagement of Students Across Three Domains (n=278)

Domain	Mean	SD	Verbal Interpretation
Affective Engagement	3.43	0.585	High
Cognitive Engagement	3.55	0.526	High
Psychomotor Engagement	4.43	0.293	Very High

Table 8

Overall Engagement of Students Across Three Domains (n=278)

Domain	Mean	SD	Verbal Interpretation
Overall Engagement	**3.68**	**0.423**	**High**

The overall mean was 3.68 (SD = 0.423), interpreted as **high engagement**. Among the three domains, psychomotor engagement was the highest, while affective and cognitive engagement remained high but slightly lower.

This indicates that students were actively involved in learning, particularly in performing tasks and applying knowledge. The findings suggest that AI tools support a balanced learning experience by integrating emotional, cognitive, and practical aspects of engagement.

Table 9

Level of Academic Performance of Students Using AI Tools (n=278)

Item	Mean	SD	Verbal Interpretation
1. Improvement of overall academic performance	3.53	0.861	High
2. Achieving higher grades	3.44	0.896	High
3. Completing assignments accurately	3.66	0.850	High
4. Enhancing problem-solving abilities	3.63	0.826	High
5. Understanding exam-related material effectively	3.60	0.851	High
6. Meeting learning objectives	3.50	0.818	High
7. Assessing learning performance and improving skills	3.63	0.856	High
8. Motivation to set higher academic goals	3.49	0.906	High
9. Satisfaction with academic progress	3.33	0.866	Moderate
10. Increased academic confidence	3.54	0.909	High
Overall Academic Performance	**3.54**	**0.589**	**High**

The overall mean of 3.54 (SD = 0.589) indicated a **high level of academic performance**. Students reported improvements in completing tasks, understanding lessons, and problem solving. However, satisfaction with academic progress was rated as moderate.

These findings suggest that AI tools support academic achievement, particularly in task completion and comprehension. This is consistent with studies showing that AI improves learning outcomes when used effectively (Tamayo et al., 2025).

However, the moderate level of satisfaction indicates that performance gains do not always translate into personal fulfillment. This highlights the need for reflective and meaningful learning experiences.

Table 10

Correlation Between Extent of AI Use and Overall Engagement

Variable	Mean	SD	r	p	Interpretation
Extent of AI Use	3.58	0.480	-0.028	0.642	No Significant Correlation
Overall Engagement	3.68	0.423			

The results showed a very weak and non-significant relationship (r = -0.028, p = 0.642), indicating that the extent of AI use was not significantly associated with students' engagement. This suggests that the frequency of AI tool usage alone does not determine the level of students' affective, cognitive, or psychomotor involvement in learning activities.

A possible explanation for this finding is that engagement is influenced by multiple interacting factors beyond tool usage, such as teaching strategies, classroom environment, and the quality of learning tasks. While students reported high engagement levels overall, this may be attributed more to instructional practices and learning context rather than the mere presence or frequency of AI use.

Additionally, the quality and purpose of AI use may act as a mediating factor. Students who use AI for passive tasks (e.g., copying answers or generating outputs without reflection) may not experience increased engagement, whereas those who use AI for deeper learning (e.g., problem-solving or analysis) may benefit more. This variation in usage patterns may explain why no significant overall relationship was observed.

These findings support previous research suggesting that technology integration alone does not guarantee engagement, and that meaningful, guided use is necessary to produce significant learning-related outcome.

Table 11

Correlation Between Extent of AI Use and Academic Performance

Variable	Mean	SD	r	p	Interpretation
Extent of AI Use	3.58	0.480	-0.010	0.865	No Significant Correlation
Academic Performance	3.54	0.589			

The results revealed a negligible and non-significant relationship between the extent of AI use and academic performance (r = -0.010, p = 0.865). This indicates that increased use of AI tools was not significantly related to higher academic achievement among the respondents.

This finding suggests that academic performance is a multifactorial outcome influenced by various elements such as prior knowledge, study habits, teacher support, and assessment methods. The lack of significant relationship implies that AI use, when measured only in terms of frequency or extent, may not be a strong predictor of academic success.

One possible explanation is that the effectiveness of AI depends on how it is used rather than how often it is used. Students who rely on AI for quick answers without engaging in deeper processing may not achieve meaningful learning gains. In contrast, those who use AI strategically to enhance understanding may benefit academically; however, these differences are not captured when usage is measured broadly.

Another important consideration is the use of self-reported academic performance, which may not fully reflect actual achievement levels and could weaken the observed relationship. Furthermore, instructional alignment and teacher guidance may serve as mediating variables that determine whether AI use translates into improved academic outcomes.

Overall, the findings reinforce that AI tools alone do not directly influence academic performance, and their effectiveness depends on pedagogical integration, student learning strategies, and the context in which they are used.

CONCLUSION

Based on the findings of the study, it can be concluded that students generally use Artificial Intelligence (AI) tools to support their learning, with activities such as summarizing materials, solving academic problems, and completing assignments being most frequently reported. Students demonstrated high to very high levels of engagement across affective, cognitive, and psychomotor domains, indicating positive self-reported emotional, cognitive, and task-related involvement in learning activities when using AI tools. In particular, psychomotor engagement was very high, suggesting strong self-reported ability to perform

tasks, apply concepts, and use AI tools independently and strategically. Academic performance was also rated at a high level, indicating that students perceive AI use as supportive of their academic tasks, problem solving, and self-assessment.

However, correlation analysis revealed no significant relationships between the extent of AI use and either overall student engagement or academic performance. This indicates that the frequency of AI tool usage is not statistically associated with variations in engagement or academic achievement among the respondents. The findings suggest that while AI tools are widely used and positively rated in terms of perceived engagement and performance, their extent of use alone does not predict or relate to these outcomes. Instead, the results imply that the effectiveness of AI may depend on how it is integrated into learning activities, the purpose of its use, and students' approaches to utilizing the tools within their studies.

Overall, the study indicates that AI use is associated with high levels of self-reported engagement and academic performance, but these outcomes are not significantly related to the extent of AI usage. This highlights the importance of pedagogically guided and purposeful integration of AI tools to better understand their role in learning processes.

RECOMMENDATIONS

Based on the findings and conclusions of the study, the following recommendations are proposed for key stakeholders, including school administrators, teachers, curriculum designers, students, and future researchers. These suggestions aim to guide the effective and responsible integration of Artificial Intelligence (AI) tools in education, with emphasis on improving the quality of use rather than the frequency of use.

First, teachers are encouraged to integrate AI tools purposefully into instructional activities. Since the findings showed no significant relationship between the extent of AI use and student engagement or academic performance, AI should not be treated as a direct driver of learning outcomes. Instead, it should be used to support specific learning objectives such as analysis, problem-solving, and concept clarification within well-designed tasks.

Second, teachers should provide clear guidance and scaffolding on how AI tools are used in learning activities. The results suggest that frequent use alone does not guarantee improved outcomes; therefore, students should be taught how to use AI critically, reflectively, and responsibly. Structured guidance can help ensure that AI use promotes deeper learning rather than surface-level task completion.

Third, school administrators and curriculum designers should focus on integrating AI into learning activities that promote higher-order thinking skills. Instructional designs should prioritize quality engagement through tasks that require analysis, evaluation, and application, rather than relying on AI for simple information retrieval or task completion.

Fourth, schools may implement training programs or workshops that emphasize responsible, ethical, and strategic use of AI tools. These interventions should focus on improving students' digital literacy and decision-making skills in using AI effectively in academic contexts.

Fifth, continuous monitoring and evaluation of AI integration practices should be conducted to assess not just the extent of use, but the quality and purpose of AI utilization. This will help educators identify which instructional approaches are most effective in supporting meaningful learning experiences.

Sixth, students should be guided to use AI tools as learning support rather than as a substitute for thinking and understanding. Emphasis should be placed on self-regulated learning, critical evaluation of AI-generated outputs, and independent problem-solving.

Finally, future researchers are encouraged to conduct experimental or longitudinal studies to further examine the causal effects of AI tool integration on student engagement and academic performance. Further studies may also explore additional variables such as quality of AI use, teaching strategies, digital literacy, and types of AI tools, since these factors may better explain variations in learning outcomes.

Conflict of Interest

The authors declare no conflict of interest and confirms that the study received no external funding that could have influenced the results.

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