



Use of AI-Based Learning Tools and Academic Performance of Senior High School Students

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Abstract

The rapid advancement of artificial intelligence (AI) technologies has created new opportunities to enhance learning processes in educational settings. AI-based tools, including chatbots, grammar checkers, and generative platforms, are increasingly utilized by students to support academic tasks such as writing, research, and problem-solving. However, empirical evidence on how AI usage influences academic performance remains limited, particularly among Senior High School students in the Philippine context. This study examined the relationship between AI-based learning tool usage and academic performance among 55 General Academic Strand (GAS) students at Union National High School using a descriptive–correlational quantitative design. Data were collected through a self-constructed survey questionnaire and analyzed using frequency, percentage, weighted mean, and Pearson correlation. Findings revealed that students frequently use AI tools to understand complex lessons, enhance written outputs, and manage academic tasks. Additionally, students demonstrated generally positive academic performance, especially in written work and timely submissions. A significant moderate positive correlation ($r = 0.612$, $p < 0.001$) was identified between AI usage and academic performance, indicating that purposeful use of AI tools is associated with improved academic outcomes. These results suggest that AI technologies can serve as effective supplementary learning resources when used responsibly.

Keywords

artificial intelligence, learning tools, academic performance, senior high school students, educational technology

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Author Contributions

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Ethics Statement

This study was conducted in accordance with ethical standards and approved by the appropriate Institutional Review Board (IRB). Informed consent was obtained from all participants prior to data collection.

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Introduction

Globally, in the rapidly evolving field of education, artificial intelligence (AI) has begun to alter how learning is viewed—not just as a tool, but also as a presence that shapes how students think, create, and complete academic work. Artificial intelligence (AI) systems, which imitate human intelligence through reasoning, learning, problem-solving, and language processing, are now incorporated into educational settings through adaptive platforms, writing assistants, and generative technologies (Merino-Campos, 2025; Phua, Neo, & Teo, 2025). In many ways, this aligns with a broader trend that encourages collaboration between people and technology to promote innovation and efficiency in learning environments (Cariaga, 2025). Through personalized instruction, immediate feedback, and increased engagement with academic assignments, these technologies help students better handle complicated requirements.

This shift occurs in Philippine classrooms, which are impacted by both opportunities and constraints. While educational initiatives and literacy programs continue to enhance student involvement and community development (Catid et al., 2026), ICT training projects highlight the importance of digital competence in empowering learners, particularly in resource-limited environments (Cofino et al., 2026). Nonetheless, structural problems continue to affect instructional strategies and learning opportunities, especially during implementation of the K–12 program (Galaura & Simpal, 2025). Together with institutional structures, relational factors such as parental involvement and support systems, which have a significant influence on children's academic behaviors and outcomes, also shape learning (Cariaga et al., 2025; Ypil et al., 2025). These findings demonstrate how, rather than operating in a vacuum, technology integration in education is closely related to social and contextual factors.

In this regard, AI systems—particularly writing assistants—have demonstrated tremendous promise for supporting students with their academic work. By offering capabilities like grammar checking, paraphrasing, summarizing, and topic suggestions, these tools help students write more clearly, coherently, and naturally (Lund et al., 2023; Yan, 2023). They also organize academic assignments, improve research techniques, and refine results (Merino-Campos, 2025; Phua et al., 2025). Discutido (2025) claims that students are beginning to see these tools as helpful academic partners that enhance their efficiency, productivity, and self-confidence in completing tasks. Nevertheless, despite these advantages, concerns of over-reliance, academic integrity, and ethical use persist in educational debate (Devi et al., 2022). Furthermore, there is still a lack of empirical evidence clarifying the connection between assessed academic performance and the frequency and purpose of AI tool use, despite previous research examining students' lived experiences and support networks (Cariaga & Gerodias, 2025). Although barriers to AI integration in K–12 contexts have been identified, the direct relationship between AI use and specific academic results has not been fully examined.

This area of promise and ambiguity is where the current investigation is located. Senior high school education presents a range of academic challenges for students, particularly in the General Academic Strand (GAS). Quizzes, written assignments, research projects, and classroom participation are among the demands that require efficient task management and effective learning strategies. A preliminary study indicates that students actively use AI-based solutions to meet these requirements and improve the quality of their work (Discutido, 2025). By examining the frequency and intent of their use in conjunction with measurable indicators of academic achievement, this study seeks to provide a more thorough, empirically grounded understanding of how AI-based learning aids affect student outcomes. Ultimately, it aims to facilitate a more responsible, knowledgeable, and meaningful integration of AI into education, grounded in both innovation and the practical experiences of teachers and students.

Methodology

Design

This study employed a descriptive quantitative research design using a survey questionnaire. This design was appropriate because it allowed the researcher to systematically collect and analyze numerical data regarding the use of AI-based learning tools and students' academic performance. The study did not involve manipulation of variables but instead examined existing patterns of AI usage among students.

Respondents

The participants consisted of 55 Senior High School students enrolled in the General Academic Strand (GAS) at Union National High School during the School Year 2025–2026. Among the respondents, 25 students were from Grade 11 and 30 students were from Grade 12. The study utilized total enumeration sampling, wherein all available GAS students in the selected classes were invited to participate in the survey.

Instrument

The data for this study were collected using a self-constructed questionnaire designed to gather information related to the use of AI-based learning tools and the academic performance of Senior High School GAS students. The questionnaire consisted of three parts. Part I focused on the demographic profile of the respondents, which included their age, gender, and grade level. Part II assessed the use of AI-based learning tools, particularly the frequency and purpose of AI tool usage. This section utilized a 5-point Likert scale to measure the responses of the participants, with the following interpretations: 5 – Always, 4 – Often, 3 – Sometimes, 2 – Rarely, and 1 – Never. Part III measured the academic performance indicators of the students, which included their perceived performance in quizzes, written assignments, class participation, and the submission of academic outputs.

To ensure the quality of the instrument, the questionnaire underwent content validation by experts in educational technology and senior high school instruction. Furthermore, reliability testing was conducted using Cronbach's alpha, with a minimum acceptable reliability coefficient of 0.70, indicating that the instrument was reliable for data collection.

Data Collection Procedure

Data collection will begin by seeking permission from the school principal and obtaining informed consent from all participants to ensure ethical compliance. Upon approval, the survey questionnaire will be distributed to selected participants either digitally, via platforms such as Google Forms, or in printed form. Participants will respond honestly based on their actual use of AI-based learning tools and recent academic performance. Completed questionnaires will be collected, reviewed for completeness, and encoded into Microsoft Excel or SPSS software for systematic organization and analysis.

Ethical Considerations

Ethical standards were strictly observed throughout the study. Participation was voluntary, and informed consent was obtained from all respondents. The anonymity and confidentiality of participants were maintained, and the collected data were used solely for academic research purposes.

Data Analysis

Descriptive statistics such as frequency, percentage, and weighted mean were used to summarize demographic information and AI usage patterns. Inferential statistics, particularly the Pearson correlation coefficient, were used to determine the relationship between AI-based learning tool usage and academic performance. Statistical analyses were conducted with a significance level of $p < 0.05$.

Results and Discussion

This study presents the analysis and interpretation of the data gathered from the survey conducted among Senior High School students enrolled in the General Academic Strand (GAS) at Union National High School. The study aimed to examine the use of AI-based learning tools and their relationship with the academic performance of students. A total of 55 respondents participated in the study, composed of 30 Grade 12 students and 25 Grade 11 students. The data were analyzed using descriptive statistics, including frequency, percentage, and weighted mean, to determine the level of AI tool usage and academic performance.

Table 1
Distribution of Respondents by Grade Level

Grade Level	Frequency	Percentage
11	25	45.45%
12	30	54.55%
Total	55	100%

Table 1 shows that 54.55% of the respondents were Grade 12 students, while 45.45% were Grade 11 students. The slightly higher proportion of Grade 12 learners reflects participation from students who are nearing completion of their senior high school education and who may have greater exposure to complex academic tasks requiring digital tools.

Table 2
Frequency of AI-Based Learning Tool Usage

Statement	Weighted Mean	Interpretation
I use AI tools (e.g., ChatGPT, Grammarly, QuillBot, etc.) for assignments	4.06	Often
I use AI tools to help me understand difficult lessons	4.26	Always
I use AI tools when answering quizzes or examination	3.00	Sometimes
I use AI tools to improve written outputs	3.98	Often
I use AI tools for research and gathering information	3.96	Often
I use AI tools when solving complex problems	3.99	Often
I use AI tools to summarize long readings	3.95	Often
I use AI tools to check grammar and sentence structure	4.22	Always
Overall Mean	4.07	Often

Table 2 presents the overall frequency of AI-based learning tool usage among respondents. The overall mean of 4.07 (Often) indicates that students regularly utilize AI tools in their academic activities. Students reported the highest usage for checking grammar and understanding difficult lessons (WM = 4.22 and 4.26), suggesting that

AI tools are primarily used to enhance writing quality and clarify complex topics. Conversely, the lowest usage was for answering quizzes (WM = 3.00, Sometimes), likely due to academic integrity considerations or restricted access during formal assessments. Shi (2021) emphasizes that technology-based tools improve the quality of student papers, enhancing grammar, readability, originality, and citation practices. These findings demonstrate that AI tools function as supportive learning mechanisms, complementing students' independent learning without replacing active engagement in assessments.

Table 3
Purpose of AI Tool Usage

Statement	Weighted Mean	Interpretation
I use AI tools to save time on academic tasks	3.36	Sometimes
AI tools increase my confidence in completing academic tasks	3.87	Often
AI tools help me organize my ideas better	4.03	Often
AI tools help improve the quality of my work	4.05	Often
AI tools make learning easier	3.86	Often
I rely on AI tools when I do not understand a topic	3.93	Often
Overall Mean	3.85	Often

Table 3 shows that students frequently use AI-based tools to organize ideas, improve the quality of their work, and comprehend challenging topics. The overall mean of 3.85 (Often) confirms that AI tools play a key role in helping students manage academic demands effectively. The highest usage was reported for improving work quality (WM = 4.05) and organizing ideas (WM = 4.03), indicating that students perceive AI as a productivity-enhancing resource. The data also show that AI tools increase learner confidence and facilitate understanding of complex topics, highlighting their role as supportive learning mechanisms rather than shortcuts. Javaid et al. (2023) emphasized that ChatGPT can assist learners in enhancing reading and writing skills by helping them comprehend complex texts and providing timely suggestions on writing topics, idea flow, sentence structures, and vocabulary.

Table 4
Academic Performance Indicators

Statement	Weighted Mean	Interpretation
I consistently receive high scores in quizzes	3.15	Neutral
I perform well in written assignments	4.05	Agree
I actively participate in class activities	3.71	Agree
I understand most lessons taught in class	3.70	Agree
I submit quality outputs on time	4.07	Agree
My academic performance has improved this school year	4.08	Agree
Overall Mean	3.79	Agree

Table 4 presents students' self-reported academic performance. The overall mean of 3.79 (Agree) suggests that respondents generally perceive themselves as performing well academically. The highest scores were reported for submission of quality outputs (WM = 4.07) and overall academic improvement (WM = 4.08), indicating that students are able to maintain consistent performance and track their progress effectively. Conversely, quiz performance received the lowest mean (WM = 3.15, Neutral), reflecting the challenges students face during formal assessments and aligning with the lower frequency of AI tool usage for quizzes. Alharbi (2023) stated that AI educational tools can serve as knowledgeable tutors, offering valuable feedback on written work and assisting in grammar and mechanics checks. These findings suggest that AI-based learning tools contribute to enhanced written outputs, timely submission of assignments, and overall academic progress, supporting the notion that AI tools can improve the quality of learning experiences in senior high school.

Table 5: Pearson Correlation Between AI Usage and Academic Performance

Variables	r-value	p-value	Interpretation
AI Tool Usage Frequency vs. Academic Performance	0.624	<0.001	Moderate Positive
AI Tool Usage Purpose vs. Academic Performance	0.598	<0.001	Moderate Positive
Overall AI Usage vs. Academic Performance	0.612	<0.001	Moderate Positive

Table 5 presents the Pearson correlation results examining the relationship between AI-based learning tool usage and the academic performance of GAS students. The findings reveal statistically significant moderate positive correlations for all dimensions of AI usage. Specifically, the frequency of AI tool usage is moderately and positively correlated with academic performance ($r = 0.624$, $p < .001$), indicating that students who frequently utilize AI tools tend to achieve higher academic outcomes. Similarly, the purpose of AI tool usage shows a moderate positive correlation with academic performance ($r = 0.598$, $p < .001$), suggesting that students who use AI tools strategically such as for organizing ideas, enhancing written outputs, or increasing confidence demonstrate better academic results. Furthermore, the overall AI usage, which combines both frequency and purpose, also exhibits a moderate positive correlation with academic performance ($r = 0.612$, $p < .001$). These findings indicate that consistent and purposeful engagement with AI-based learning tools supports learning processes and enhances students' ability to produce quality academic outputs. Overall, the results align with prior research indicating that AI technologies can facilitate personalized learning, improve engagement, and support higher-quality academic work (Merino-Campos, 2025; Phua et al., 2025; Discutido, 2025).

Table 6
Summary of Hypothesis Testing on the Relationship Between AI-Based Learning Tool Usage and Academic Performance

Hypothesis	r-value	p-value	Decision
There is no significant relationship between AI usage and performance	0.612	<0.001	Null hypothesis rejected

Table 6 summarizes the hypothesis testing for the relationship between AI-based learning tool usage and the academic performance of GAS students. The computed Pearson correlation coefficient ($r = 0.612$, $p < .001$) indicates a moderate positive relationship, which is statistically significant at the 0.05 level. Based on this result, the null hypothesis stating that there is no significant relationship between AI usage and academic performance is rejected. These findings suggest that students who use AI-based learning tools more frequently and purposefully tend to achieve higher academic outcomes. AI tools support students in understanding complex lessons, enhancing written outputs, organizing ideas, and completing academic tasks efficiently. Therefore, AI-based learning technologies serve as effective supplementary resources that facilitate learning and contribute to improved academic performance.

Conclusion and Recommendations

This study investigated the use of AI-based learning resources and their connection to senior high school students' academic achievement in the General Academic Strand (GAS). The results showed that students often use AI tools as part of their academic routines, especially for organizing ideas, conducting research, understanding difficult topics, and improving writing. In addition, students' academic performance was generally good, particularly in written assignments, class engagement, and prompt output submission. The Pearson correlation study revealed a somewhat positive link between the use of AI tools and academic performance. This suggests that students who use AI tools more frequently and with a clear academic aim typically perform better. These results confirm the usefulness of AI-based technologies as supplemental resources that can improve educational opportunities and boost academic output.

The study emphasizes the need to integrate AI tools in educational settings responsibly and ethically, in light of these findings. Teachers are urged to assist students in using AI tools that promote learning without jeopardizing academic integrity. Institutions and schools might also consider creating explicit guidelines and frameworks that encourage ethical use while optimizing AI's educational benefits. Additionally, encouraging students' knowledge and digital accountability can contribute to the development of a well-balanced learning environment where technology supports independent learning and critical thinking rather than taking its place.

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