Utilization of Artificial Intelligence on the Learning and Performance of Students: Implications for Teaching Strategy

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ABSTRACT

This study examined the extent of artificial intelligence (AI) utilization and its relationship with the learning performance of junior high school students in the Schools Division of Tacloban City during School Year 2025–2026. It specifically determined the AI platforms used by learners, their frequency and duration of AI use, common academic tasks, AI competence, perceived challenges, and learning performance. It tested the relationship between AI utilization and learning performance. The study used a descriptive-correlational research design with 208 Grade 7 to Grade 10 students selected through stratified random sampling across school size categories. Data were gathered using a validated researcher-developed questionnaire and analyzed using descriptive statistics and Spearman's rho at the 0.05 and 0.01 levels of significance. Findings showed that ChatGPT was the most commonly used AI platform. Overall AI utilization was moderate, with learners using AI mainly for academic clarification, lesson summarization, and improvement of written work. The learners demonstrated a generally competent level of AI competence, particularly in AI literacy and verification skills, but showed areas for improvement in technical skills and ethical citation practices. They also reported challenges related to misinformation, privacy, and possible overdependence on AI. They rated learning performance in engagement, motivation, productivity, and critical thinking as very satisfactory. AI utilization had significant relationships with selected aspects of learning performance, particularly motivation, task completion, and critical thinking, but showed no significant relationship with overall learning performance. These findings suggest that AI use may be associated with specific learning outcomes but should not be viewed as a direct predictor of overall learning performance. Based on these findings, the study proposed an AI-supported teaching enhancement strategy to promote responsible and effective AI use in learning.

Keywords: artificial intelligence, AI utilization, learning performance, junior high school learners, AI competence.

INTRODUCTION

Artificial Intelligence (AI) is becoming increasingly common in education and is changing how students access information, complete academic tasks, and support their learning. AI tools can provide personalized learning experiences, immediate feedback, help with routine tasks, and wider access to learning resources (Hasanein & Sobaih, 2023). These benefits can support students when AI is used as a learning aid. However, AI also raises important concerns. These include overreliance on AI, reduced critical thinking, academic dishonesty, privacy concerns, and biased or inaccurate outputs (Marín et al., 2025; Illinois Education Report, 2024). Thus, the growing use of AI in education requires a better understanding of how students use these tools and how that use may relate to learning.

Recent literature shows that AI use in education has both benefits and challenges. Hasanein and Sobaih (2023) found that students and other education stakeholders identified several reasons for using ChatGPT for academic purposes, while also recognizing both positive and negative consequences. The study emphasized the need for clear guidance and training to support responsible AI use. Similarly, Marín et al. (2025) highlighted ethical concerns related to AI in education, including data privacy, equity, academic integrity, and algorithmic bias. These studies show that the value of AI in education cannot be judged only by how often students use it. The way students understand, evaluate, and use AI is also important. At the same time, the existing literature has largely examined AI use in higher education, leaving less evidence about younger learners.

AI competence is therefore an important part of understanding student AI use. AI competence refers to a learner's ability to understand AI, use AI tools properly, check AI-generated information, and ethically apply AI. Students may have access to the same AI tools but differ in their ability to use them effectively and responsibly. Differences in access to devices, internet services, and AI-capable platforms may also affect students' exposure to these tools. However, existing studies have not fully examined AI utilization, AI competence, perceived challenges, and learning performance together in the same group of junior high school learners. This gap is especially noticeable in the Philippine setting, where evidence on how younger learners experience and use AI for academic purposes remains limited. The issue is also relevant in actual classroom settings. In high school, learners may use AI to get explanations, practice activities, and immediate feedback. At the same time, some learners may rely too heavily on AI, submit work they did not produce themselves, or accept inaccurate AI-generated information without checking it. These classroom observations suggest that students may differ in their level of AI exposure, competence, and ability to use AI responsibly. However, such observations need systematic evidence rather than personal experience alone. A clearer understanding of these differences can help schools and teachers respond to the growing use of AI among younger learners.

Despite the growing body of research on AI in education, localized evidence on junior high school learners remains limited, particularly on how the extent of AI use relates to learning performance while also considering students' AI competence and perceived challenges. Most existing studies have examined higher education or focused on either the benefits or risks of AI rather than examining these factors together. Addressing this gap can provide a more complete view of how junior high school learners use AI for academic purposes and how this use relates to their learning. Therefore, this study assessed the extent of AI utilization and its relationship with the learning performance of junior high school students in the Schools Division of Tacloban City during School Year 2025–2026. Specifically, it examined the learners' demographic profile, commonly used AI-capable platforms, frequency and duration of AI use, academic tasks performed using AI, AI competence, perceived challenges, and learning performance. It also determined whether a significant relationship existed between AI utilization and learning performance and used the findings to inform an AI-supported teaching enhancement strategy. The findings may help teachers and schools better understand students' current AI use and provide appropriate guidance for effective, responsible, and ethical AI use in learning.

METHODOLOGY

Research Design

This study employed a descriptive-correlational research design to assess the learners' demographic profile, commonly used AI-capable platforms, extent of AI utilization, AI competence, challenges in AI use, learning performance, and the relationship between AI utilization and learning performance. The descriptive component summarized the respondents' age, sex, grade level, AI tools used, frequency, duration, and task types of AI use. It also described AI competence in terms of AI literacy, verification and critical thinking, ethical and responsible use, technical proficiency, integration with learning tasks, and attitude and readiness, as well as learning performance in engagement, self-regulation, motivation, task completion, productivity, and critical thinking or problem-solving. Frequency counts, percentages, and means were used to organize and summarize the data and describe the learners' AI-related experiences during School Year 2025–2026. The correlational component determined whether a significant relationship existed between the extent of AI utilization and learning performance using Spearman's rank-order correlation (Spearman rho). This design was appropriate because it allowed the researcher to describe existing conditions and examine relationships among variables without manipulating them. It provided baseline information on junior high school students in the Schools Division of Tacloban City and identified relationships that may support the development of evidence-based interventions (Creswell & Creswell, 2018).

Research Locale

This study was conducted in the Schools Division of Tacloban City, one of the 13 school divisions under the Department of Education (DepEd) Region VIII – Eastern Visayas. The division is the primary government agency responsible for delivering basic education services to learners in Tacloban City. It supervises and monitors a total of 60 public elementary and secondary schools, which are categorized as follows: 40 purely elementary schools, four integrated schools offering both elementary and junior high school programs, one

integrated school offering elementary, junior high, and senior high school programs, four purely junior high schools, eight schools offering both junior and senior high school, and one purely senior high school. For this study, the focus was on the 17 schools with junior high school programs, as these institutions cater to learners within the Grade 7 to Grade 10 levels, the primary respondents of this research. These schools represent a diverse population in terms of student demographics, resource availability, and teaching-learning environments, making them appropriate settings for examining the extent of exposure and utilization of Artificial Intelligence (AI), AI competence and readiness, and perceived usefulness and challenges as they relate to student learning and academic performance.

Research Respondents

This study involved 208 junior high school learners from Grades 7 to 10 in selected public secondary schools in the Schools Division of Tacloban City. The study focused solely on learners to examine their AI utilization, AI competence, perceived challenges, and learning performance. From the 17 schools offering junior high school programs, the researchers used a multi-stage sampling technique. The researchers first stratified schools by enrollment size (mega large, large, medium, and small), then proportionately and randomly selected six schools across the four categories. The number of respondents per grade level varied according to school size, with 16 learners per grade level from the mega large school and 4 learners per grade level from small schools. This approach followed proportionate stratified sampling, aligning each stratum's sample with its relative size in the population (Creswell & Creswell, 2018; Fraenkel, Wallen, & Hyun, 2019). Stratified sampling also helped ensure that important school-size groups were adequately represented, while allocating 4 to 16 learners per grade level provided balanced and manageable representation across strata (Fraenkel et al., 2019; Cohen, Manion, & Morrison, 2018). Within each selected school, simple random sampling selected learners from each grade level. The researchers obtained official class lists from advisers or school registrars, assigned numbers to learners, and selected the required participants using a random number generator or the fishbowl technique. This gave every learner an equal chance of selection and helped minimize sampling bias (Creswell & Creswell, 2018). Combining stratified sampling across school size categories with simple random sampling within schools provided a representative and reliable group of 208 respondents reflecting the diversity of junior high school learners in the division.

Research Instrument

The primary research instrument was a structured, researcher-made questionnaire designed to collect quantitative data on the learners' demographic profile, AI utilization, AI competence, perceived challenges, and learning performance. The researchers developed it from literature on AI literacy, digital learning behaviors, and student performance indicators. The questionnaire underwent expert validation to ensure the relevance, clarity, and alignment of its items with the study variables, after which the researchers made minor revisions. The researchers also pilot-tested it before full administration and used Cronbach's alpha to assess internal consistency. The questionnaire consisted of six parts. Part I gathered the learners' age, sex, and grade level. In contrast, Part II identified the AI platforms and applications they used, including ChatGPT, Google Gemini, Microsoft Copilot, and AI features in social media applications. Part III measured the extent of AI utilization through 15 items covering frequency, duration, and task types using a five-point scale from 1 (Never) to 5 (Always). Part IV assessed AI competence through 24 items covering AI literacy, verification and critical thinking, ethical and responsible use, technical proficiency, integration with learning tasks, and attitude/readiness using a scale from 1 (Not competent) to 5 (Highly competent). Part V measured perceived challenges through 20 items rated from 1 (Strongly Disagree) to 5 (Strongly Agree), covering cheating and plagiarism, overreliance, misinformation, privacy, limited access, lack of guidance, originality, and independent thinking. Part VI measured self-assessed learning performance through five dimensions: learning engagement, self-regulated learning, motivation to learn, task completion and productivity, and critical-thinking/problem-solving skills. Each dimension contained four items rated from 1 (Needs Improvement) to 5 (Outstanding). The questionnaire was aligned with the study's statement of the problem and supported the systematic measurement of learner experiences with AI and learning performance for descriptive and correlational analysis.

Content validity was established through expert review by a panel of examiners, the research adviser, and a statistician, who evaluated the items for clarity, relevance, and alignment with the research objectives. The

researchers incorporated their recommendations to refine the questionnaire and ensure it was appropriate for junior high school learners, following recommended practices in educational research (Creswell & Creswell, 2018). The experts confirmed that the items were relevant, clear, and aligned with the intended constructs, with consolidated validity scores meeting accepted standards for content adequacy (Polit & Beck, 2006; Zamanzadeh et al., 2015). The questionnaire was then pilot-tested with approximately 20 junior high school students who were not part of the final sample. The pilot-test results showed that the major scales met the acceptable reliability threshold of 0.70, indicating good internal consistency (Taber, 2018). The Extent of AI Utilization indicators yielded Cronbach's alpha coefficients ranging from 0.822 to 0.919, with a composite reliability of 0.948. The AI Competence subscales ranged from 0.756 to 0.908, with a composite reliability of 0.950. Perceived Challenges in the Use of AI obtained an acceptable reliability coefficient of 0.747, while the five Learning Performance subscales yielded coefficients ranging from 0.706 to 0.777, with a composite reliability of 0.885. Overall, the reliability results confirmed that all parts of the questionnaire had satisfactory to excellent internal consistency, supporting its suitability for data collection in the study.

Data Gathering Procedure

The researcher collected the primary data using the researcher-developed questionnaires after securing the necessary approvals and permits. The researcher submitted formal requests to the Schools Division Superintendent and the heads of the participating junior high schools, then coordinated with class advisers and teachers to schedule administration without disrupting regular classes. Before distributing the questionnaires, the researcher explained the purpose of the study, emphasized voluntary participation, and obtained informed consent. Respondents were assured that their responses would remain confidential and would be used only for academic purposes. For learners under 18, the researcher secured parental consent in compliance with ethical research guidelines (Creswell & Creswell, 2018). The researcher administered the questionnaires in person during school hours in a group setting, provided standardized instructions, and clarified questions while ensuring respondents answered independently and honestly. Completion took approximately 20–30 minutes. After collection, the questionnaires were checked for completeness, and the responses were coded and entered into a spreadsheet for processing. Demographic data were summarized using frequencies, percentages, and measures of central tendency, while Likert-scale responses were scored and averaged based on the specified scoring guidelines. The resulting dataset was then used for the study's descriptive and inferential statistical analyses.

Data Analysis Procedure

The data were analyzed using descriptive and inferential statistics. Frequencies and percentages described the learners' demographic profile in terms of age, sex, and grade level, as well as the commonly used AI-capable platforms. Weighted means were computed to determine the extent of AI utilization, level of AI competence, perceived challenges in AI use, and learning performance. Spearman rho correlation was used to determine the relationship between AI utilization and learning performance, as this nonparametric test is appropriate for ordinal and continuous variables that may not meet the assumptions of normality. For interpretation, age was coded from 1 to 7 for ages 12 to 18, sex was coded as 1 for male and 2 for female, and grade level was coded from 1 to 4 for Grades 7 to 10. Mean scores for AI utilization were interpreted as very high (4.21–5.00), high (3.41–4.20), moderate (2.61–3.40), low (1.81–2.60), and very low to no utilization (1.00–1.80). AI competence was interpreted as highly competent (4.21–5.00), competent (3.41–4.20), moderately competent (2.61–3.40), slightly competent (1.81–2.60), and not competent (1.00–1.80). Perceived challenges were interpreted from strongly agree (4.21–5.00) to strongly disagree (1.00–1.80), while learning performance was interpreted from outstanding (4.21–5.00) to needs improvement (1.00–1.80), with the corresponding intermediate categories based on the specified mean ranges.

Ethical Considerations

This study strictly observed ethical standards to protect the rights and welfare of all participants. The researchers obtained permission to conduct the study from the Schools Division Office of Tacloban City and the school heads of the participating junior high schools. The researchers secured informed consent from all participants, and for students below 18 years of age, they requested parental or guardian consent before participation. Participants were informed of the purpose of the study, the voluntary nature of their involvement,

and their right to withdraw at any time without penalty. They were assured that their responses would be treated with strict confidentiality, that no personally identifiable information would be disclosed, and that the data would be used solely for academic and research purposes. During data collection, the questionnaires were administered to ensure privacy and prevent coercion. After data analysis, the results were reported in aggregate form so that no individual respondent could be identified. These procedures were consistent with ethical research practices recommended by Creswell and Creswell (2018) and complied with the Data Privacy Act of 2012 (RA 10173) in the Philippines.

RESULTS AND DISCUSSION

Profile of the Learners

Table 1 presents the demographic profile of the 208 junior high school learners in the study, by age, sex, and grade level, in the Schools Division of Tacloban City. The distribution of learners' ages shows that most are 14–15 years old (54.8%), with nearly all respondents aged 12–16, reflecting the typical age range of junior high school learners under the K to 12 Basic Education Program. This finding is consistent with Boligao & Naparota (2025), who reported that most Philippine junior high school learners are in mid-adolescence, a developmental stage marked by increasing cognitive development and independence. Zhong and Liu (2025) further noted that learners in this age group are developmentally positioned to engage with emerging technologies and develop foundational AI literacy skills. By sex, females comprise 63.5% of respondents, while males account for 36.5%. This female-majority composition is similarly observed in Philippine junior high school studies (Boligao & Naparota, 2025). International evidence from Qazi et al. (2022) also indicates nuanced gender differences in ICT use and digital confidence, suggesting that males and females may approach technology differently despite often having comparable overall skill levels. These patterns highlight the importance of considering gender-related differences in confidence, perceived usefulness, and preferred AI-supported tasks when examining AI utilization.

Table 1 Profile of the Learners

Profile		***f***	**%**
Age	18 years old	1	0.5
	17 years old	1	0.5
	16 years old	16	7.7
	15 years old	61	29.3
	14 years old	53	25.5
	13 years old	40	19.2
	12 years old	36	17.3
	Total	**208**	**100**
Sex	Male	76	36.5
	Female	132	63.5
	Total	**208**	**100**
Grade Level	Grade 10	51	24.5
	Grade 9	54	26
	Grade 8	52	25
	Grade 7	51	24.5
	Total	**208**	**100**

Respondents are also fairly distributed across grade levels, with Grade 7 at 24.5%, Grade 8 at 25.0%, Grade 9 at 26.0%, and Grade 10 at 24.5%. Fulgencio and Marcia (2025) noted that a similar distribution across grade levels strengthens educational research by allowing meaningful comparisons of digital learning behaviors as learners progress through junior high school. This balanced representation therefore provides a basis for examining how AI utilization and competence may develop across grade levels. Overall, the demographic profile reflects a typical Philippine junior high school population characterized by a predominantly mid-adolescent age group, female majority, and balanced grade-level representation. The Global Education Monitoring Report Team (2023) reported that these characteristics suggest that respondents are at an ideal stage for fostering responsible and effective AI use, particularly as education systems increasingly emphasize

technology integration and digital innovation. Consistent with Zhong and Liu (2025) and Qazi et al. (2022), the findings emphasize the need for AI-supported teaching strategies that are developmentally appropriate and responsive to possible gender- and grade-related differences in technology use.

Common AI-Capable Platforms Utilized

Table 2 illustrates the distribution of the most commonly used AI-capable platforms among the 208 junior high school learners in the Division of Tacloban City. The data show which tools dominate students' day-to-day learning practices and provide an important backdrop for interpreting their AI utilization, competence, and learning performance in the succeeding tables.

Table 2 Common AI-Capable Platforms Utilized

AI Capable Platforms	***n***	**%**	**Rank**
ChatGPT (Open AI)	145	69.7	1
Google Gemini (Bard)	70	33.7	3
Microsoft Copilot / Bing AI	24	11.5	4
AI Tools in Social Media (e.g., Snapchat MyAI, TikTok filters with AI)	88	42.3	2
Others (e.g., Cici, Grammarly, Gauthmath, Dola)	26	12.5	5

The results show that ChatGPT, developed by OpenAI, is the most widely used AI platform, with 69.7% (*n* = 145) of learners reporting that they use it. This reflects national and global trends in which generative AI chatbots have become mainstream study aids, with Martinez (2025) reporting that 63% of Filipino students use these tools to generate text, translate, explain difficult concepts, and summarize academic articles. Similarly, Deng et al. (2025) and Alfarwan (2025) noted that, with sound pedagogy, ChatGPT can improve academic performance, motivation, and higher-order thinking. Thus, the strong preference for ChatGPT highlights the need for teaching strategies that promote its critical and ethical use. AI tools embedded in social media platforms, including Snapchat MyAI and TikTok filters, rank second at 42.3% (*n* = 88). This demonstrates that learners encounter AI not only through academic tools but also through entertainment and social networking platforms. Hussain et al. (2025) emphasized that AI-driven beauty filters and recommendation systems may influence young people's self-image and digital behavior, while Masri-zada et al. (2025) warned that heavy and unregulated engagement with social media technologies may contribute to anxiety, depression, and problematic screen use. These findings suggest that AI-related teaching strategies should incorporate digital well-being and critical media literacy, particularly for understanding AI-mediated social media content.

Google Gemini ranks third, with 33.7% (*n* = 70) of learners reporting its use. Along with ChatGPT, Gemini has increasingly been recognized as a generative AI tool for language and writing support, including essay drafting, grammar refinement, and content generation. Al-Kadi & Ali (2024) and Espartinez (2024) found that such tools can provide personalized feedback and support self-regulated learning, while also presenting risks related to academic integrity and over-reliance when not properly guided. Meanwhile, 11.5% (*n* = 24) used Microsoft Copilot/Bing AI, while 12.5% (*n* = 26) used other tools such as Cici, Grammarly, Gauthmath, and Dola. Al-Kadi & Ali (2024) and Alfarwan (2025) identified ChatGPT, Gemini, and Copilot as major generative AI tools in education, while noting that familiarity, accessibility, and local language support influence learner adoption. The lower use of Copilot and other tools may therefore reflect limitations in device integration, awareness, or perceived usefulness. Overall, learners' AI ecosystem is dominated by ChatGPT, supplemented by substantial use of social-media-embedded AI and general-purpose LLMs such as Gemini. This distribution highlights the increasingly blurred boundary between academic and recreational AI use, particularly in social media environments that can influence learners' motivation, well-being, and attention. As Deng et al. (2025), Alfarwan (2025), and Espartinez (2024) emphasize, the findings support accompanying AI adoption in schools with robust AI literacy programs, clear governance frameworks, and teacher training to ensure AI enhances rather than undermines student learning and development.

Extent of AI Utilization

Table 3 presents data on the extent to which junior high school learners utilize artificial intelligence (AI) tools across three dimensions, such as frequency, duration, and task types, based on their own responses. The

levels of utilization were interpreted using a standardized Likert scale, where mean scores of 2.61–3.40 reflect "moderate" use and scores below this range indicate "low" engagement.

Table 3 Extent of Utilization of AI among the Learners

Category	Indicators	Mean	Interpretation
Frequency of AI Use	I use AI tools (e.g., ChatGPT, Google Gemini) almost every day for schoolwork.	2.9	Moderate
	I regularly use AI when completing assignments or projects.	2.99	Moderate
	I consult AI tools frequently to clarify lessons or understand difficult topics.	3.4	Moderate
	Using AI tools is a routine part of how I study or prepare for exams.	2.75	Moderate
	Mean	**3.01**	**Moderate**
Duration of AI Use	I spend a significant amount of time per day using AI tools for learning tasks.	2.55	Low
	When I use AI, I stay engaged for a long period before completing my schoolwork.	2.59	Low
	I dedicate enough time exploring AI-generated answers and refining them before using them.	2.9	Moderate
	The time I spend using AI tools is longer compared to other digital resources (e.g., Wikipedia, YouTube).	2.48	Low
	Mean	**2.63**	**Moderate**
Task Types for AI Use	I use AI tools to generate ideas or brainstorm for assignments.	3.27	Moderate
	I use AI to summarize or explain lessons I do not fully understand.	3.53	High
	I use AI to check or improve my written work (grammar, structure, style).	3.5	High
	I use AI to solve practice problems in Math, Science, or other subjects.	3.12	Moderate
	I use AI to translate words or texts to improve understanding.	3.43	High
	I use AI to create or edit digital outputs (presentations, essays, reports).	2.83	Moderate
	I use AI to prepare for quizzes or exams (review questions, mock tests).	2.81	Moderate
	Mean	**3.17**	**Moderate**
Overall Mean Extent of Utilization		**2.94**	**Moderate**

Note: 4.21 – 5.00 - Very high utilization; 3.41 – 4.20 - High utilization; 2.61 – 3.40 - Moderate utilization;1.81 – 2.60 - Low utilization; 1.00 – 1.80 - Very low to no utilization

The data indicate that learners demonstrated a moderate extent of AI utilization (mean = 2.94), suggesting that AI tools are integrated into academic activities to a functional but not intensive degree. This finding aligns with Holmes et al. (2022), who reported that secondary students worldwide increasingly incorporate AI into school-related tasks, although usage varies by access, familiarity, and teacher guidance. Learners also reported moderate AI use (mean = 3.01), with the strongest tendency to consult AI to clarify difficult topics (M = 3.40). This indicates that AI is already being used as supplemental academic support, particularly when students encounter challenges in their coursework (Deng et al., 2025). However, Zhong and Liu (2025) suggested that moderate rather than high frequency may indicate that learners are still determining how and when to use AI effectively or may lack confidence in its usefulness without teacher guidance. AI engagement was low to moderate in duration (mean = 2.63), indicating that learners generally do not spend extended periods using AI for learning tasks. This may reflect digital fatigue or a tendency to use AI for specific parts of academic tasks rather than for sustained study sessions. Luckin et al. (2016) similarly found that learners often access digital tools intermittently because of limited digital literacy and competing academic activities. Nevertheless, this level of engagement creates opportunities for schools to integrate AI more systematically into curricular activities through structured, purposeful use.

Across task types, learners showed high use of AI for summarizing content (*M* = 3.53), improving written work (*M* = 3.50), and translating text (*M* = 3.43). Students also reported moderate utilization for brainstorming ideas, solving practice problems, and preparing for assessments (mean = 3.17). Holmes et al. (2022) and Zhong & Liu (2025) noted that these patterns align with research showing that students tend to use AI for cognitively supportive and text-processing tasks, particularly summarization and writing improvement. Deng et al. (2025) further explained that AI's natural language processing capabilities make it particularly useful for reformulating ideas and clarifying concepts. Overall, the moderate extent of AI utilization suggests that although learners are aware of and actively using AI tools, their integration into sustained academic routines remains emergent rather than firmly established. Educators and school leaders may therefore consider professional development that strengthens teachers' ability to guide purposeful AI use while developing learners' competence in incorporating AI into study routines. As Luckin et al. (2016) noted, encouraging longer and more strategic AI engagement within guided contexts may enhance learning outcomes. Moreover, Holmes et al. (2022) and Zhong & Liu (2025) emphasized that heavy use of AI for text-related tasks highlights the need for AI literacy curricula that train students to critically evaluate and ethically use AI outputs while maximizing benefits and mitigating risks such as over-dependence and inaccuracies.

Level of AI Competence

Table 4 shows learners' competence in using artificial intelligence (AI) across six major domains: AI literacy, verification and critical thinking, ethical and responsible use, technical proficiency, integration with learning tasks, and attitude and readiness to use AI. Using a five-point scale, the general interpretation indicates that learners fall within the "competent" range across most domains, reflecting a developing yet functional ability to use AI tools effectively in academic settings.

Table 4 Level of AI Competence of Learners

Category	**Indicators**	**Mean**	**Interpretation**
AI Literacy	I understand what Artificial Intelligence (AI) is and its basic uses in education.	3.61	Competent
	I can identify which AI tools are appropriate for my school tasks.	3.49	Competent
	I know how to write effective prompts or questions to get useful results from AI.	3.17	Moderately Competent
	I am aware of the limitations of AI and that it can make mistakes.	4	Competent
	Mean	**3.57**	**Competent**
Verification and Critical Thinking	I double-check AI-generated information with reliable sources before using it.	3.91	Competent
	I can identify errors, bias, or irrelevant information in AI responses.	3.57	Competent
	I reflect carefully on whether AI suggestions truly meet the requirements of my school tasks.	3.64	Competent
	I use AI responses as a starting point, not as the final answer.	3.55	Competent
	Mean	**3.67**	**Competent**
Ethical and Responsible Use	I avoid submitting AI-generated work as if it were entirely my own.	3.33	Moderately Competent
	I cite AI assistance when required by my teacher.	3.32	Moderately Competent
	I protect my personal information and do not share sensitive data with AI tools.	3.81	Competent
	I follow school or teacher guidelines about when and how AI can be used.	3.88	Competent
	Mean	**3.58**	**Competent**

Technical Proficiency	I can access and use AI platforms or tools without much difficulty.	3.38	Moderately Competent
	I can solve simple technical problems when using AI (e.g., logging in, rephrasing a prompt).	3.41	Competent
	I can use AI to complete different school tasks such as writing, practice exercises, or brainstorming.	3.21	Moderately Competent
	I feel comfortable navigating AI interfaces and features.	2.99	Moderately Competent
	Mean	**3.25**	**Moderately Competent**
Integration with Learning Tasks	I use AI to help me understand difficult lessons or topics.	3.69	Competent
	I balance AI assistance with my own effort and thinking.	3.74	Competent
	I adapt AI-generated suggestions to meet the specific requirements of my assignments.	3.26	Moderately Competent
	I use AI in ways that improve my learning and not just to finish work quickly.	3.71	Competent
	Mean	**3.6**	**Competent**
Attitude and Readiness to Use AI	I can use AI tools confidently to support my learning tasks.	3.58	Competent
	I can explore and try new AI tools or features with minimal guidance.	3.52	Competent
	I can apply AI appropriately to improve the quality of my academic work.	3.4	Moderately Competent
	I can demonstrate responsible and ethical use of AI in learning activities.	3.49	Moderately Competent
	Mean	**3.5**	**Competent**
Overall Mean AI Competence		**3.53**	**Competent**

Note: 4.21 – 5.00 - Highly competent; 3.41 – 4.20 – Competent; 2.61 – 3.40 - Moderately competent; 1.81 – 2.60 - Slightly competent; 1.00 – 1.80 - Not competent

The learners demonstrate an overall competent level of AI literacy, with a category mean of 3.57. They show strong awareness of AI's basic functions and limitations, particularly in understanding AI's uses and recognizing that AI can make mistakes (*M* = 4.00). However, their ability to write effective prompts is only moderately competent (*M* = 3.17), indicating a need for further training in prompt engineering and maximizing AI outputs. Deng et al. (2025) and Zhong and Liu (2025) similarly found that students increasingly understand the conceptual aspects of AI but require targeted instruction in its practical application. Learners also demonstrate the highest competence in verification and critical thinking, with a mean of 3.67, as reflected in their tendency to double-check AI outputs (*M* = 3.91), identify errors or bias (*M* = 3.57), and use AI as a starting point rather than unquestioningly accepting its outputs (*M* = 3.55). This aligns with Holmes et al. (2022), who found that exposure to AI tools can strengthen students' evaluative habits regarding accuracy and credibility.

In terms of ethical and responsible use, learners achieved a competent mean of 3.58, particularly in protecting personal information (*M* = 3.81) and following school guidelines (*M* = 3.88). However, they were only moderately competent in avoiding academic dishonesty (*M* = 3.33) and citing AI assistance when necessary (*M* = 3.32). Espartinez (2024) similarly reported that students may understand ethical guidelines conceptually but struggle to apply them consistently, especially regarding academic integrity. Technical proficiency was the lowest-rated domain, with a mean of 3.25, indicating moderate competence. Although learners can address simple technical problems (*M* = 3.41), they experience greater difficulty navigating AI interfaces confidently (*M* = 2.99) and using AI across diverse academic tasks (*M* = 3.21). Luckin et al. (2016) emphasized that being a digital native does not necessarily mean possessing strong digital skills, highlighting the need for explicit training in educational technologies.

Learners also demonstrate strong competence in integrating AI with learning tasks, with a category mean of 3.60. They frequently use AI to understand difficult lessons (*M* = 3.69) and balance AI assistance with personal

effort (*M* = 3.74), suggesting that they can use AI as a cognitive aid rather than simply as a shortcut. However, adapting AI-generated suggestions to specific assignment requirements remains moderately competent (*M* = 3.26). This supports Holmes et al. (2022), who found that students benefit more from AI when taught to contextualize its outputs rather than copy generated content. Meanwhile, learners show a competent level of attitude and readiness to use AI, with a mean of 3.50, including confidence in using AI tools (*M* = 3.58) and willingness to explore new platforms with minimal guidance (*M* = 3.52). Nevertheless, their ability to apply AI responsibly to enhance academic work remains moderately competent (*M* = 3.49), consistent with UNESCO (2023), which reported that Gen Z learners generally have positive attitudes toward AI but still need support in translating readiness into ethical practice. Overall, the competence level of 3.53 indicates that learners are generally well-prepared to use AI as an academic support tool, although targeted areas for improvement remain. Schools may strengthen instruction in prompt engineering, AI evaluation, responsible citation, and technical proficiency, particularly through training in AI tool navigation, troubleshooting, and multi-feature use. Given learners' strong readiness and positive attitudes, educators can develop meaningful AI-enhanced learning experiences that promote ethical, critical, and higher-level cognitive use of AI technologies.

Perceived Challenges in AI Utilization

Table 5 outlines the challenges junior high school learners perceive when using artificial intelligence (AI) tools for academic tasks.

Table 5 Perceived Challenges in AI Utilization

Challenges	**Mean**	**Interpretation**
I am concerned that AI may lead to cheating or plagiarism among us.	3.86	Agree
I worry that I may become too dependent on AI instead of thinking for themselves.	3.88	Agree
I am concerned that AI may provide incorrect or biased information that could mislead us.	3.96	Agree
I worry about privacy and data security when using AI tools.	3.91	Agree
I am concerned that using AI too often may reduce my critical thinking and creativity.	3.88	Agree
I find that I and some students do not disclose AI use, which raises issues of academic honesty.	3.58	Agree
I lack sufficient knowledge or skills to use AI tools effectively.	3.21	Neutral
I experience difficulty accessing AI tools because of limited internet connection or devices.	3.33	Neutral
I am unsure how to evaluate whether AI-generated information is reliable or accurate.	3.46	Agree
I sometimes feel overwhelmed by the many AI tools and features available.	3.32	Neutral
I do not always receive guidance from teachers on how to use AI properly for learning.	3.04	Neutral
I worry that AI tools may not align with the instructions or expectations given by my teachers.	3.66	Agree
I am concerned that my classmates who use AI will have an unfair advantage over those who cannot access it.	3.76	Agree
I struggle to maintain originality in my work when AI suggestions influence my ideas.	3.60	Agree
I tend to rely too much on AI, which sometimes makes me put less effort into understanding the lesson.	3.26	Neutral
I notice that I depend on AI for answers even when I can solve the task on my own.	3.17	Neutral
I feel less confident doing schoolwork without AI assistance.	2.92	Neutral
I struggle to think independently when AI tools are available.	2.89	Neutral
I sometimes accept AI-generated answers without verifying their accuracy because it is more convenient.	2.90	Neutral
I find it difficult to complete assignments when AI tools are unavailable.	2.73	Neutral
Mean	**3.41**	**Agree**

Note: 4.21 – 5.00 – Strongly Agree; 3.41 – 4.20 – Agree; 2.61 – 3.40 - Neutral; 1.81 – 2.60 - Disagree; 1.00 – 1.80 – Strongly Disagree

With an overall mean of 3.41 (Agree), the findings indicate that learners recognize various academic, ethical, cognitive, and access-related concerns associated with AI use. The strongest concern is the risk of misinformation, with the highest mean of 3.96, as learners agree that AI may provide incorrect or biased information. This is consistent with Deng et al. (2025), who noted that large language models may generate inaccurate, hallucinated, or biased responses, highlighting the importance of verification skills. Zhong & Lie (2025) likewise emphasized that recognizing AI's fallibility reflects developing AI literacy and critical evaluation competencies. Privacy and data security also emerged as a major concern (*M* = 3.91), demonstrating learners' awareness of risks related to personal data exposure. UNESCO (2023) similarly identified data governance as a core challenge in AI-supported learning systems, emphasizing the cybersecurity implications of students' interactions with AI. Learners also agreed that AI may lead to over-dependence and reduced critical thinking or creativity, with both items averaging 3.88. Holmes et al. (2022) support these concerns, noting that excessive reliance on generative AI may reduce cognitive engagement, independent thinking, and creative output when not properly monitored. Learners also acknowledged that AI may cause them to exert less effort in understanding lessons (*M* = 3.26, Neutral to Agree), suggesting that reliance tendencies may already be emerging. Ethical concerns were likewise evident, particularly regarding cheating or plagiarism (*M* = 3.86) and failure to disclose AI use (*M* = 3.58). Espartinez (2024) identified academic integrity as one of the most widespread challenges associated with student AI use, particularly when rules for proper citation and disclosure are unclear.

Concerns about equity and access were also evident. Learners agreed that classmates with better access to AI may gain unfair advantages (*M* = 3.76), consistent with Alfarwan (2025), who found that unequal access to digital tools can deepen existing learning disparities, particularly where internet connectivity and device availability are limited. Learners also expressed neutral but notable concerns regarding limited access (*M* = 3.33) and insufficient skills to use AI effectively (*M* = 3.21), indicating continuing infrastructural and competency gaps. Additionally, learners reported moderate uncertainty in evaluating AI-generated information (*M* = 3.46) and feeling overwhelmed by the number of available AI tools (*M* = 3.32). Zhong and Liu (2025) similarly identified navigating multiple platforms and assessing their reliability as common challenges for young learners still developing digital judgment. Overall, the learners' agreement (*M* = 3.41) reflects widespread concerns about AI's risks and limitations, particularly misinformation, ethical integrity, dependency, fairness, and data privacy. These findings suggest that schools need to implement AI literacy programs, strengthen academic integrity policies, and provide explicit teacher guidance to promote safe, equitable, and meaningful AI integration. Improving access to reliable connectivity and strengthening students' technical and evaluative competencies are likewise essential to prevent AI use from reinforcing existing educational disparities.

Learning Performance

Table 6 summarizes the learning performance of junior high school respondents across five domains: learning engagement, self-regulated learning, motivation to learn, task completion and productivity, and critical thinking/problem-solving skills.

Table 6 Learning Performance of the Respondents

Learning Category	Indicator	Mean	Interpretation
Learning Engagement	I actively participate in class activities and discussions.	3.98	VS
	I stay focused during lessons and avoid distractions.	3.92	VS
	I regularly use the learning resources or tools provided by my teacher.	4.01	VS
	I complete learning tasks because I am genuinely interested in the subject.	3.88	VS
	Mean	**3.95**	**VS**
Self-Regulated Learning	I set goals for my schoolwork and try to achieve them.	4.10	VS
	I manage my time well when working on school tasks.	3.76	VS
	I monitor my progress and adjust my study habits when necessary.	3.70	VS

	I review lessons on my own even without being reminded.	3.65	VS
	Mean	**3.80**	**VS**
Motivation to Learn	I am eager to learn new lessons and skills.	4.01	VS
	I put effort into my tasks because I want to improve academically.	4.10	VS
	I am motivated to study even when lessons are difficult.	3.85	VS
	I take pride in producing quality outputs for my subjects.	3.74	VS
	Mean	**3.93**	**VS**
Task Completion and Productivity	I submit my assignments or requirements on time.	3.94	VS
	I accomplish tasks efficiently without unnecessary delay.	3.64	VS
	I complete class activities even when they require extra effort.	3.97	VS
	I produce outputs that meet or exceed the standards set by my teachers.	3.79	VS
	Mean	**3.83**	**VS**
Critical Thinking/ Problem-Solving Skills	I analyze information before making conclusions.	3.97	VS
	I solve problems by applying what I have learned.	4.02	VS
	I evaluate whether the information I encounter is correct and reliable.	3.91	VS
	I explain my answers or solutions using clear reasoning.	3.75	VS
	Mean	**3.91**	**VS**
Overall Mean Learning Performance		**3.88**	**VS**

Note: 4.21 – Outstanding (O); 3.41 – 4.20 – Very Satisfactory (VS); 2.61 – 3.40 – Satisfactory (S); 1.81 – 2.60 – Fair (F); 1.00 – 1.80 – Needs Improvement (NI)

Based on the rating scale, all categories fall within the "Very Satisfactory (VS)" range, with an overall composite mean of 3.88, indicating that learners generally demonstrate strong academic behaviors, motivation, and cognitive skills necessary for effective learning. Learning engagement obtained the highest mean of 3.95, showing that learners actively participate in discussions, remain focused during lessons, and consistently use teacher-provided resources. This aligns with Estrada et al. (2021), who emphasized that engaged learners demonstrate stronger persistence and improved academic outcomes, particularly when supported by interactive and technology-enhanced learning environments. Self-regulated learning yielded a very satisfactory mean of 3.80, indicating that learners often set academic goals, manage their time, monitor their study habits, and review lessons independently. Panadero (2022) noted that such behaviors reflect increasing responsibility for learning and are associated with better academic performance and adaptation to complex learning tasks. Learners also showed strong motivation to learn, with a mean of 3.93, reflected in their eagerness to develop new skills and put in effort to improve academically. Schunk & DiBenedetto (2020) identified motivation as a critical factor in learners' persistence when facing challenging lessons, which is reflected in the respondents' enthusiasm and pride in producing quality work.

Task completion and productivity obtained a mean of 3.83, indicating that learners generally complete assignments on time, work efficiently, and meet teacher expectations. These behaviors demonstrate academic responsibility and a strong work ethic, consistent with Torres et al. (2021), who noted that productive learners who consistently meet deadlines tend to achieve better academic outcomes. Meanwhile, critical thinking and problem-solving skills received a very satisfactory mean of 3.91. Learners demonstrated the ability to analyze information, apply concepts, verify accuracy, and provide reasoned explanations, supporting Arcondé and Capuno (2023) that exposure to diverse information sources and active learning strategies can strengthen analytical and evaluative skills. Overall, the very satisfactory learning performance (M = 3.88) indicates that learners possess strong engagement, motivation, self-regulation, productivity, and higher-order cognitive skills that can support effective AI-assisted learning. These strengths suggest that integrating AI tools into instruction may further enhance analytical thinking, productivity, and autonomous learning. However, teachers should continue designing activities that sustain intrinsic motivation and deepen higher-order thinking while

strengthening AI literacy and active inquiry, ensuring that AI serves as an enhancer rather than a substitute for learners' existing academic abilities.

Relationship between the Extent of AI Utilization and Learning Performance

Table 7 presents the relationship between the extent of AI utilization, measured through frequency of use, duration, and task types, and the different dimensions of learning performance among junior high school students. Using Spearman's rho correlation, the analysis determines whether AI use is significantly associated with learning engagement, self-regulated learning, motivation to learn, task completion and productivity, and critical thinking/problem-solving skills. Decisions on accepting or rejecting the null hypothesis were based on a 0.05 level of significance.

Table 7 Relationship between the Extent of AI Utilization and Learning Performance

Variables		**Extent of Relationship**			
AI Utilization	**Learning Performance**	r_s	***p-value***	**Decision**	**Interpretation**
Frequency	Learning Engagement	0.07	0.351	Do not Reject H_0	Not Significant
	Self-Regulated Learning	0.11	0.115	Do not Reject H_0	Not Significant
	Motivation to Learn	**.17***	**0.017**	**Reject H_0**	**Significant**
	Task Completion and Productivity	**.19****	**0.005**	**Reject H_0**	**Significant**
	Critical Thinking/ Problem-Solving Skills	**.21****	**0.003**	**Reject H_0**	**Significant**
Duration	Learning Engagement	0.003	0.971	Do not Reject H_0	Not Significant
	Self-Regulated Learning	0.01	0.934	Do not Reject H_0	Not Significant
	Motivation to Learn	0.05	0.458	Do not Reject H_0	Not Significant
	Task Completion and Productivity	0.04	0.601	Do not Reject H_0	Not Significant
	Critical Thinking/Problem-Solving Skills	0.03	0.644	Do not Reject H_0	Not Significant
Task Types	Learning Engagement	0.1	0.162	Do not Reject H_0	Not Significant
	Self-Regulated Learning	0.03	0.639	Do not Reject H_0	Not Significant
	Motivation to Learn	0.14	0.052	Do not Reject H_0	Not Significant
	Task Completion and Productivity	**0.15***	**0.032**	**Reject H_0**	**Significant**
	Critical Thinking/Problem-Solving Skills	0.13	0.064	Do not Reject H_0	Not Significant
Overall AI Utilization	**Overall Learning Performance**	**0.12**	**0.096**	**Do not Reject H_0**	**Not Significant**

**Correlation is significant at the 0.05 level of significance*

***Correlation is significant at the 0.01 level of significance*

The results show that the frequency of AI use is significantly and positively related to motivation to learn (r_s = .17, p = .017), task completion and productivity (r_s = .19, p = .005), and critical thinking/problem-solving skills (r_s = .21, p = .003). This suggests that learners who use AI tools more frequently tend to be more motivated, complete academic tasks more efficiently, and demonstrate stronger cognitive processing. Deng et al. (2025)

similarly found that frequent engagement with generative AI can improve task performance, cognitive scaffolding, and motivation when appropriately used, while Zhong and Liu (2025) explained that AI feedback mechanisms can promote deeper reasoning and self-refinement. However, Holmes et al. (2022) reported that frequent AI use was not significantly associated with learning engagement or self-regulation, indicating that AI use alone does not automatically improve behavioral engagement or independent learning management, which remain influenced by learner habits and teacher guidance. In contrast, the duration of AI use showed no significant relationship with any learning performance indicator. Shorter or longer AI use was not meaningfully associated with engagement, motivation, productivity, or critical thinking. This supports Luckin et al. (2016), who emphasized that time spent using AI does not inherently indicate meaningful learning; purposeful, guided, and reflective use matters more. Extended AI engagement may even lead to inefficient browsing or reliance instead of productive learning, suggesting that duration alone is not an adequate predictor of academic outcomes.

Regarding task types, a significant relationship emerged only for task completion and productivity (r_s = .15, p = .032). This suggests that purposeful AI applications, such as summarizing, checking grammar, and generating practice questions, may help learners complete academic tasks efficiently and meet requirements. This finding is consistent with Schunk and DiBenedetto (2020), who noted that targeted AI-supported tasks can promote academic efficiency by reducing cognitive load and helping learners refine their work. However, task types were not significantly related to the other learning performance dimensions, suggesting that AI needs to be integrated meaningfully rather than superficially to produce broader academic benefits. Finally, overall AI utilization was not significantly related to overall learning performance (r_s = .12, p = .096). Although certain patterns and frequencies of AI use are associated with specific learning indicators, overall AI utilization does not directly predict holistic academic performance. Alfarwan (2025) and UNESCO (2023) similarly emphasized that AI alone does not determine learning success; rather, meaningful outcomes depend on pedagogical framing, learner metacognition, and the ethical and critical use of AI.

CONCLUSION

Based on the study's findings, the respondents represent a typical junior high school population, characterized by a predominance of mid-adolescent learners, more females than males, and balanced representation across grade levels. Regarding AI-capable platforms, learners showed a strong preference for ChatGPT and AI features integrated into social media, suggesting that their AI adoption is mainly driven by convenience, accessibility, and familiarity with these platforms rather than formal educational exposure to AI technologies. Overall, AI utilization was moderate, indicating that AI tools have begun to become part of students' academic routines but are not yet fully embedded in their daily learning processes. Learners tended to use AI more often for academic clarification and text-processing tasks than for extended study sessions or complex cognitive activities, suggesting that AI has considerable potential as a learning resource but is not yet fully utilized. The learners demonstrated an overall competent level of AI competence, particularly in AI literacy and verification skills, indicating their ability to recognize AI limitations and evaluate AI-generated information. However, moderate competence in technical proficiency and ethical citation practices suggests a need for systematic instruction in responsible and effective AI use. The perceived challenges also showed that learners were aware of concerns related to misinformation, privacy, overdependence, creativity loss, and academic integrity. Neutral responses regarding internet and device limitations and insufficient teacher guidance further highlight the need for institutional support to promote equitable and safe AI use. Meanwhile, respondents demonstrated very satisfactory learning performance across all evaluated domains, including engagement, motivation, self-regulation, productivity, and critical thinking, indicating strong learning behaviors even without heavy dependence on AI. The findings further show that AI utilization is associated with specific aspects of learning performance, particularly motivation, task completion, and critical thinking, but is not significantly related to overall learning performance. Frequency and task-type utilization were associated with certain learning behaviors, whereas the duration of AI use showed no meaningful relationship. The absence of a significant relationship between overall AI utilization and overall learning performance suggests that AI use alone is not a determining factor of academic success. Instead, the quality, purpose, and manner of AI use appear to be more important than the amount or duration of use. Thus, AI should be viewed as a complementary learning tool that can support specific learning processes but cannot replace foundational study skills, intrinsic motivation, and critical thinking. Overall, the study concludes that although learners have begun integrating AI into their

academic lives, deeper, more purposeful, and ethically guided use is needed to maximize its benefits. AI can support specific learning outcomes, but its effectiveness depends on learners' competence, teacher guidance, and responsible integration into instructional practices.

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