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Exploring the Use of AI as Learning Resources in Academics by Junior High School

Brixter E. Adoremos, Roberto H. Layague Jr., and Arlita C. Sion
Junior High School, Jose Rizal University

Abstract

This study is an exploration of the use of AI of JHS students as learning resources. The design of the research is a comparative - narrative design which is a mixed method of quantitative and qualitative data. The participants are JHS students selected through stratified sampling. The data will be collected through a survey both for quantitative and qualitative data. The exploration showed the demographics and level of understanding in using AI as a learning resource has high perspective. There is a significant difference in this level of understanding depending on the frequency of usage of AI. The issues of students while using AI are inaccuracy and misinformation; lack of guidance on AI usage; difficulty in comprehending AI responses; over - reliance on AI tools; and technical and accessibility issues. Initiatives are made using T3 framework by Magana that is divided into translational, transformational and transcendent.

Keywords: AI Usage, Junior High School Students, Learning Resource, T3 Framework

Introduction

Learning resources are essential privileges for any educational institution, serving as the foundation for effective teaching and meaningful learning. In the era of Education 4.0, as highlighted in an article by Joshi (2022) in Forbes, the landscape of learning resources has been significantly transformed by the integration of advanced technologies such as smart devices, artificial intelligence (AI), and robotics. These tools are no longer futuristic concepts but are actively being utilized by both teachers and students to enhance educational experiences. Among these, AI stands out as a particularly influential tool, especially in today's VUCA (Volatile, Uncertain, Complex, and Ambiguous) environment. In such a context, the ability to access timely information and make informed decisions is crucial, and AI plays a pivotal role in supporting these needs within the teaching and learning process.

However, the use of AI in education, particularly by students, has sparked varied interpretations and responses across academic institutions. Each institution has approached the integration of AI differently, crafting its own set of policies, guidelines, or rules to govern its use. This divergence has led to ongoing debates about whether AI should be permitted in academic settings, especially in tasks like writing, research, and assessment. Despite these differing views, the reality is that AI usage is becoming increasingly inevitable. As a result, its presence is reshaping multiple aspects of education, including instructional delivery, collaboration among learners and educators, assessment methods, and the overall dynamics of the learning environment. According to the Stanford Accelerator for Learning (2025), the effective use of AI in education requires a shared language and a comprehensive framework that considers the perspectives of users (teachers and students), developers, and critics. AI, when used as a learning resource, processes data in the language of its users and transforms it into valuable academic outputs, thereby supporting creativity and productivity in educational work.

Nevertheless, the integration of AI into student learning is not without its challenges. One of the primary concerns is the authenticity and reliability of AI-generated content. There is often a disconnect between the prompts given by students and the responses generated by AI, which can lead to confusion or misinformation. A study by Gokcearslan (2024) identified several specific challenges faced by students when using AI tools. These include limited interactivity, the potential for misleading or inaccurate answers, insufficient personalized feedback, difficulty in interpreting complex expressions, and the risk of receiving outdated information. Additionally, there are concerns about the impact of AI on students' communication skills, particularly in terms of voice modulation and intonation. Other challenges include the initial difficulty of adapting to new technologies and significant issues related to data protection and privacy. These concerns highlight the need for thoughtful implementation and continuous evaluation of AI tools in education to ensure they truly enhance learning rather than hinder it.

This study seeks to answer the following questions:

1. What is the AI utilization profile of the students such as
a. Age,
b. Grade Level,
c. Sex, and
d. Usage?
2. To what extent is the level of understanding of students in the utilization of AI in academics terms of:
a. Personalization
b. Accessibility
c. Adaptability
d. Efficiency
e. Critical Thinking Skills
3. Is there a significant difference in the level of understanding of students in the utilization of AI when grouped according to different profiles?
4. What are the issues in the utilization of AI in academics encountered by the students?

This study aims to explore the AI profiles of students and their understanding of AI utilization in academic settings, focusing on various dimensions such as personalization; accessibility; adaptability; efficiency; and critical thinking and soft skills, privacy concerns, access to technology, and customization. The study will analyze the significant differences in AI utilization based on diverse student profiles examining how these demographics such as age, grade level, sex, and usage may influence AI adoption and effectiveness.

The research will investigate the issues encountered by students in using AI for academic purposes. These may include concerns related to data privacy, ethical considerations, digital equity, over-reliance on AI tools, or difficulties in integrating AI into traditional learning models.

The findings from this study will initiate the development of guidelines or rules for the effective and responsible use of AI in education. These guidelines will aim to optimize AI's benefits while addressing the challenges and ensuring ethical practices. The initiative will serve as a framework for educators, administrators, and students to maximize the potential of AI in enhancing learning experiences while promoting equitable and inclusive access to AI technologies in academic contexts.

Literature Review/Analytical Framework

Theoretical Framework

This study is grounded in several established theories that provide a foundation for understanding students' utilization and comprehension of Artificial Intelligence (AI) in academic settings. The Technology Acceptance Model (TAM) developed by Davis (1989) serves as a primary theoretical underpinning, explaining that individuals' acceptance and use of technology depend largely on their perceived usefulness and perceived ease of use. In this context, the students' AI utilization profile reflects their attitudes and behaviors towards AI tools in academic tasks, influenced by how beneficial and user-friendly they find these technologies.

Complementing TAM is the Constructivist Learning Theory, which posits that learners actively construct knowledge through experiences and social interactions. This theory helps explain how AI can facilitate critical thinking and the development of essential soft skills by providing personalized and adaptable learning experiences tailored to each student's needs. Adaptive learning theories further support this notion by highlighting how AI's capacity for personalization and adaptability enhances engagement and learning outcomes by delivering customized content and feedback.

Another important aspect addressed in this study is the accessibility of AI tools, especially considering the digital divide that affects equitable access to technology. Theories of digital equity emphasize the disparities in access that can hinder students from fully benefiting from AI's potential in education. Therefore, examining accessibility is crucial for understanding barriers students face in utilizing AI effectively.

Furthermore, Cognitive Load Theory (Sweller, 1988) provides insight into how AI can improve learning efficiency by minimizing extraneous cognitive load. By automating routine tasks and providing efficient learning support, AI allows students to focus more on higher-order skills such as critical thinking and problem-solving, which are vital for academic success and personal development.

Together, these theories frame the conceptual foundation of this study, which investigates the relationships between students' profiles (including demographic factors and technology proficiency), their AI utilization patterns, their level of understanding regarding personalization, accessibility, adaptability, efficiency, and critical thinking, as well as the challenges they encounter in using AI academically. This integrated framework guides the exploration of differences in AI understanding and use among students with diverse backgrounds, aiming to provide comprehensive insights into the role of AI in contemporary education.

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Conceptual Framework

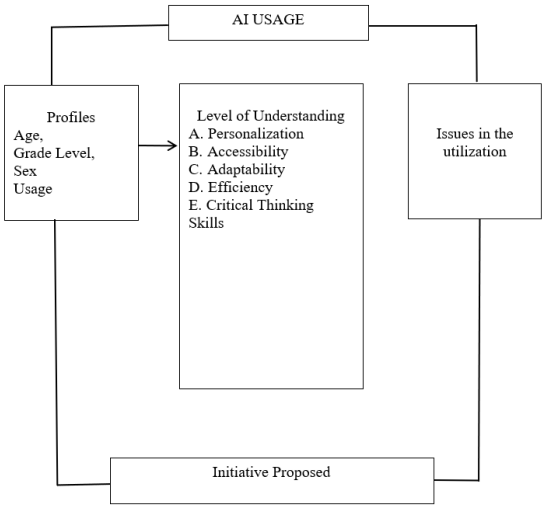

Figure 4. Conceptual Framework of the Study

This study was conceptualized to investigate the usage of artificial intelligence (AI) among students, with a focus on understanding how it influences their learning experiences. As AI becomes increasingly integrated into educational environments, it is essential to explore how students interact with these technologies. The study aims to examine three primary variables: demographics, level of understanding, and the issues students encounter while using AI. By analyzing these aspects, the research seeks to provide a comprehensive view of AI's role in modern education.

The first variable explored in this study is the demographic profile of the students. This includes age, grade level, sex, and the frequency with which students use AI as a learning resource. These demographic factors are crucial in identifying patterns and trends in AI usage across different student groups. Understanding who uses AI, how often, and in what contexts can help educators and policymakers tailor AI tools to better meet the needs of diverse learners.

The second variable focuses on the students' level of understanding of AI, which is broken down into five sub-variables: personalization, accessibility, adaptability, efficiency, and critical thinking skills. These components reflect how well students grasp the functionalities and benefits of AI in their learning processes. In addition to quantitative data, the study will also collect qualitative responses to uncover the issues students face when using AI. These insights will provide depth to the analysis, highlighting challenges such as technical difficulties, lack of guidance, or concerns about reliability and fairness.

After collecting and analyzing the data, the study will conduct tests to determine if there are significant differences in the level of understanding when grouped according to demographic variables. This statistical analysis will help identify which groups may benefit more or less from AI integration in education. The findings will serve as a foundation for developing targeted initiatives and strategies to enhance the effective use of AI as a learning resource, ensuring that all students can benefit from its potential regardless of their background.

Literature Review

The integration of Artificial Intelligence (AI) into academic settings has transformed traditional teaching and learning processes, providing innovative tools and techniques that enhance educational outcomes. AI technologies have been increasingly utilized to support students in personalized learning, fostering engagement, and offering adaptive learning pathways tailored to individual needs.

AI as a Learning Resource

AI-powered educational tools, such as intelligent tutoring systems, virtual assistants, and adaptive learning platforms, have demonstrated significant potential in improving academic performance. According to Luckin et al. (2016), AI-driven systems enable learners to receive immediate, personalized feedback and access diverse resources that cater to their learning styles. For Junior High School (JHS) students, who are at a critical stage of intellectual and emotional development, these tools provide unique opportunities for engagement and mastery of concepts.

Personalized Learning: AI systems can analyze individual learner data to tailor content, pace, and difficulty levels, thereby supporting differentiated instruction. Adaptive learning platforms like DreamBox, Smart Sparrow, and Carnegie Learning exemplify how AI can customize learning pathways to meet diverse student needs (Kukulska-Hulme, 2020). AI-powered learning systems include chatbots, recommendation engines, adaptive learning platforms, and virtual tutors. These tools can customize learning experiences to individual students' strengths and weaknesses. Platforms like Khan Academy, Duolingo, Socratic by Google, and Squirrel AI use AI to personalize education and support self-paced learning (Holmes et al., 2021).

Studies consistently highlight how AI-driven adaptive learning platforms analyze student performance, learning styles, and knowledge gaps to dynamically adjust content, pace, and instructional methods (Johnson & Smith, 2019; Luckin et al., 2016; Zawacki-Richter et al., 2019). This individualization leads to improved engagement, motivation, and academic outcomes by providing tailored feedback and customized learning pathways (Holmes et al., 2019; Mustapha et al., 2023).

Benefits of AI in Academics

Increased Engagement: AI-infused gamified tools make learning more interactive and motivating (Chou, 2018).The adoption of AI in education offers numerous advantages, particularly in enhancing academic learning for JHS students. Xu et al. (2020) highlight that

AI tools facilitate self-paced learning, empowering students to explore complex topics at their own speed. Additionally, AI systems encourage critical thinking and problem-solving through interactive modules and gamified content, which are highly appealing to younger learners. Studies also show that AI promotes inclusivity by offering multilingual support and accessibility features, ensuring equitable learning opportunities for students with diverse needs (Holmes et al., 2019). Instant Feedback: Intelligent systems provide immediate responses and suggestions, helping learners correct mistakes in real-time (Chen & Xie, 2022).

Intelligent Tutoring Systems (ITS), a core application of AI in academics, provide individualized, real-time feedback and guidance, effectively mimicking a human tutor (Luckin et al., 2016; Ma et al., 2014; Mousavinasab et al., 2021). These systems are shown to enhance learning outcomes in various subjects, foster deep learning and critical thinking, and particularly benefit students in STEM fields (Lee et al., 2024; Xu & Ouyang, 2022; International Journal of Science and Research Archive, 2024).

Challenges in AI Implementation

While AI offers transformative potential, its implementation in education is not without challenges. Selwyn (2019) underscores issues related to digital equity, as students from underprivileged backgrounds may lack access to the necessary technology or reliable internet connections. Furthermore, concerns about data privacy and the ethical use of AI in tracking student performance have been raised by researchers like Hwang et al. (2020). These challenges necessitate careful consideration to ensure that AI's benefits are maximized while minimizing its drawbacks.

Digital Divide: Access to AI tools is not uniform across all schools or communities, leading to inequity (OECD, 2021). Data Privacy: The use of AI in education raises concerns about the collection and use of student data (Williamson & Piattoeva, 2020). The absence of robust regulatory frameworks and clear guidelines for data governance in many educational contexts exacerbates these vulnerabilities (AMT Lab @ CMU, 2025).

The literature also expresses concern about the potential for over-reliance on AI, leading to diminished critical thinking and essential skills. While AI can efficiently process information, it may reduce opportunities for students to engage in deep learning, problem-solving, creativity, and self-regulation if not carefully integrated

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with human interaction (Wu, 2023; EDUCAUSE, n.d. a; Journal of Pedagogical Research, 2025). This concern is exacerbated by the rise of generative AI, which introduces challenges related to academic dishonesty and plagiarism (Qadir, 2023; College of Education | Illinois, 2024).

AI and JHS Students

Junior High School students benefit significantly from AI tools that are designed to align with their developmental and cognitive needs. AI applications such as virtual labs, subject-specific chatbots, and interactive quizzes support active learning and foster curiosity (Chen et al., 2021). Furthermore, teacher-mediated integration of AI ensures a balanced approach, combining the advantages of AI with the pedagogical expertise of educators.

Emerging Trends in AI for EduThe integration of Artificial Intelligence (AI) in education has been a subject of growing interest and research. Numerous studies have explored the potential benefits and challenges of using AI techniques to enhance the learning experience and improve academic outcomes, The study conducted by Mallillin (2024) specifically aimed to examine the influence of AI on students' academic performance, focusing on factors like improved student performance, attitudes toward learning, motivation for study habits, and learning mechanisms. The research findings indicated that AI effectively caters to the specific learning needs of students, leading to comprehensive and improved learning experiences.

Emerging literature indicates that students have varying opinions on the usage of AI tools, and that AI has the potential to assist students in learning and ultimately increase achievement, regardless of whether the learners are adults or children (Martínez, Batanero, Cerero, & León, 2023; Trisoni et. al, 2023).

Furthermore, AI can assist students in various tasks, such as information retrieval, research, writing, and problem-solving. Language models like ChatGPT, developed by OpenAI, have demonstrated remarkable capabilities in generating human-like text, potentially aiding students in their writing assignments and research projects (Bender et al., 2021; Zheng, Niu, Zhong, & Gyasi, 2023). Additionally, AI-powered virtual assistants can provide on-demand support and guidance, acting as digital tutors or study companions (Winkler & Söllner, 2018; Chen, Jensen, Albert, Gupta, & Lee, 2023).

Synthesis

The integration of Artificial Intelligence (AI) into academic settings for Junior High School (JHS) students presents a fascinating and evolving landscape. A synthesis of current literature reveals that while AI offers substantial benefits in enhancing learning experiences and streamlining processes, its implementation for this particular age group also introduces unique pedagogical, ethical, and practical challenges that demand careful consideration.

AI not only benefits students but also supports teachers by automating repetitive tasks such as grading, tracking progress, and providing analytics. This allows educators to focus more on instruction and student engagement. In JHS settings, where classrooms can be large and diverse, AI helps teachers identify struggling learners and provide targeted interventions.

Despite its benefits, integrating AI in JHS classrooms is not without challenges. Issues such as unequal access to devices and the internet create barriers, especially in underfunded schools. Furthermore, many educators lack adequate training to effectively use AI tools, and some express concern over the potential for AI to replace human interaction in teaching. Ethical concerns such as data privacy and student surveillance also emerge in discussions around AI in education.

Studies suggest that while JHS students generally have positive attitudes toward AI tools, they still value human interaction and teacher support. They appreciate the immediate feedback and independence AI offers but do not want it to fully replace traditional learning methods. This suggests that AI should be seen as a complement, not a substitute, for human-led instruction.

To maximize the impact of AI in junior high education, future strategies should focus on training teachers, ensuring equitable access, and integrating AI literacy into the curriculum. Policies that promote ethical use and protect student data are also essential. AI has the potential to become a transformative tool in JHS classrooms when implemented thoughtfully and inclusively.

AI as a learning resource holds great promise for enhancing academic outcomes among junior high school students. It supports personalized learning, increases engagement, and provides valuable support to teachers. However, challenges such as digital inequality, teacher preparedness, and ethical concerns must be addressed to ensure effective and responsible use. The synthesis of current literature indicates that AI should be integrated as a supportive tool within a balanced educational approach that still values the irreplaceable role of teachers.

Research Method

This exploratory study seeks to investigate the potential of artificial intelligence (AI) in shaping the level of understanding in using AI of junior high school students. Recognizing the growing integration of AI technologies in educational settings, the research aims to provide empirical insights into how these tools influence student outcomes and engagement. By employing a mixed-methods approach, the study will combine quantitative and qualitative methodologies to offer a holistic understanding of AI's educational impact.The study will adopt a comparative-narrative design, integrating both quantitative and qualitative data collection and analysis techniques. This design allows for a nuanced exploration of statistical trends alongside rich, contextual narratives from student experiences.

Quantitative data will be gathered through a survey. Descriptive statistics and inferential tests will be conducted to identify significant differences in level of understanding when grouped with the demographics. Data analysis will be performed using JASP and Microsoft Excel, ensuring precision and transparency in statistical reporting.To complement the numerical data, qualitative insights will be collected through open-ended survey responses. These narratives will explore students' perceptions, issues regarding AI use in their learning environments. Thematic analysis will be conducted using Voyant Tools AI, enabling the identification of recurring themes and the formulation of actionable recommendations for AI integration in education.

The study will involve junior high school students, selected through stratified sampling to ensure representation across various demographics. This sampling method enhances the generalizability of the findings by capturing diverse student experiences.

The study will adhere strictly to ethical guidelines, with risks managed in accordance with the protocols set forth by the University Research Ethics Committee. Measures will be implemented to ensure data privacy, confidentiality, and student welfare throughout the research process.

The research paper was developed with the assistance of various AI tools, including ChatGPT, Microsoft Copilot, and Perplexity AI. These tools were leveraged to enhance the report, refine the writing, and analyze the collected data efficiently, ensuring a well-structured and insightful research output.

Results and Discussion

AI Utilization Profile of Junior High School Students

Age

Age	Frequency	Percentage
12	49	16.78
13	83	28.42
14	60	20.55
15	65	22.26
16	32	10.96
17	3	1.03
Total	292	100.00

Table 1: Age Profile

The majority of the respondents were aged 13 (28.42%) and 15 (22.26%), which falls within the early adolescent phase common in junior high school. This age range is significant because it represents a stage of increasing independence and cognitive development—factors that influence the readiness to engage with AI-powered tools.

Sajja et al. (2023) emphasized that early adolescents are particularly receptive to adaptive and interactive learning technologies. AI tools, which offer personalized feedback and pacing, can cater well to the developmental needs of this group. Their openness to experimentation and digital exploration makes them ideal candidates for early AI integration in academics.

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Grade Level

Grade Level	Frequency	Percentage
Grade 7	86	29.45
Grade 8	77	26.37
Grade 9	66	22.60
Grade 10	63	21.58
Total	292	100.00

Table 2: Grade Level Profile

Grade 7 students comprised the largest group (29.45%), followed by Grade 8 students (26.37%). This suggests that AI tools are being used not only at the higher levels of junior high school but are also becoming increasingly relevant among younger students.This pattern supports the findings of Muliana and Fithriani (2023), who observed that students in the early stages of secondary education are already integrating AI tools, especially for language and writing support. Their study suggests that exposure to AI at younger grade levels helps students build digital learning habits that support their academic growth over time.

Sex

Sex	Frequency	Percentage
Female	129	44.18
Male	163	55.82
Total	292	100.00

Table 3: Sex Profile

The sex distribution indicates a slightly higher participation of male students (55.82%) compared to female students (44.18%). However, this slight disparity does not appear to influence the overall perception or utilization of AI tools.Araka et al. (2022) found that sex does not significantly affect students' capacity to engage with AI-powered educational technologies. Their study emphasized that AI tools, when designed with inclusivity in mind, are equally beneficial for all learners regardless of sex. This supports the notion that AI integration in education should focus more on usage patterns and access rather than demographic assumptions.

Usage

Usage	Frequency	Percentage
Daily	65	22.26
Monthly	55	18.84
Never	22	7.53
Weekly	150	51.27
Total	292	100.00

Table 4: Usage Profile

The data shows that over half of the respondents (51.27%) use AI tools weekly, while 22.26% use them daily. This implies a strong presence of AI in students' academic routines, with very few reporting no usage (7.53%).Pitts et al. (2025) emphasized that consistent and frequent engagement with AI technologies enhances digital fluency and academic productivity. Regular users benefit more from AI's capacity to streamline tasks and provide adaptive feedback. This is consistent with the Technology Acceptance Model (Davis, 1989), which posits that perceived usefulness and ease of use are key drivers of technology adoption—both of which are reinforced through frequent use.The findings show that AI tools are commonly used by junior high students, especially those aged 13–15 and in Grades 7 and 8. Most students use AI weekly or daily, indicating strong engagement. While more males participated, studies show no significant gender gap in AI learning. These results suggest that students are familiar with and open to using AI in academics, making them suitable users of AI-supported learning tools.

Students' Level of Understanding of AI Utilization in Academics

Personalization

Statement	Mean	SD	Verbal Interpretation	Rank
AI tools provide me with customized recommendations that fit my learning style.	3.48	1.24	High	1
AI tools help me set and track personalized learning goals.	3.33	1.30	Moderate	3
AI adapts to my strengths and weaknesses in learning.	3.44	1.24	High	2
Overall Mean	3.41	1.16		

Cronbach's Alpha of 0.95 Verbal Interpretation 1.00 to 1.80 Very Low (VL), 1.81 to 2.60 Low (L), 2.61 to 3.40 Moderate (M), 3.41 to 4.20 High (H) and 4.21 to 5 Very High (VH) .

Table 5: Students' Perception on AI Tools in Terms of Personalization

Students generally perceived AI tools as effective in supporting personalized learning, as reflected by an overall mean score of 3.41 (SD = 1.16), which falls within the high interpretation range. Among the three evaluated items, the highest-rated statement was *"AI tools provide me with customized recommendations that fit my learning style"* (M = 3.48, SD = 1.24), indicating strong agreement and earning the top rank. Conversely, the item *"AI tools help me set and track personalized learning goals"* received the lowest mean score (M = 3.33, SD = 1.30), though still interpreted positively as moderate and ranked third. This finding is consistent with Kukulska-Hulme (2020), who emphasized that adaptive learning platforms such as Duolingo and Khan Academy tailor content to individual learning needs, promoting targeted improvement. However, the relatively lower score for goal-setting may reflect a gap in students' metacognitive skills, particularly in planning and self-monitoring. Holmes et al. (2019) similarly observed that while AI can enhance learning experiences, it cannot fully substitute for structured human guidance in setting and achieving academic objectives.

Accessibility

Statement	Mean	SD	Verbal Interpretation	Rank
AI tools make learning resources more accessible regardless of location.	3.67	1.27	High	2
AI tools help bridge gaps in understanding when teachers are unavailable.	3.73	1.31	High	1
AI provides 24/7 support for learning.	3.59	1.31	High	3
Overall Mean	3.66	1.20		

Cronbach's Alpha of 0.95 Verbal Interpretation 1.00 to 1.80 Very Low (VL), 1.81 to 2.60 Low (L), 2.61 to 3.40 Moderate (M), 3.41 to 4.20 High (H) and 4.21 to 5 Very High (VH) .

Table 6: Students' Perception on AI Tools in Terms of Accessibility

The statement that got the highest rating was "AI tools help fill in gaps in understanding when teachers aren't around," with an average score of 3.73 and a standard deviation of 1.31. This was seen as a strong positive and was ranked first by the students. The statement with the lowest rating, but still viewed positively, was "AI provides 24/7 support for learning," which had an average score of 3.59 and the same standard deviation, ranking third. These results support what Talan and colleagues (2022) found—that AI helps students learn whenever they want, making learning more flexible and available anytime. But it's important to note Selwyn's (2020) warning that not all students have equal access to these benefits because of issues like lack of reliable internet or devices. So, while students in this study appreciated how AI makes learning easier to access, its full advantages depend on having a good internet and proper technology.

Adaptability

Statement	Mean	SD	Verbal Interpretation	Rank
AI tools adjust to my learning pace and needs.	3.67	1.27	High	2
AI tools provide alternative explanations when I don't understand a concept.	3.73	1.31	High	1
AI tools suggest new topics based on my learning progress.	3.59	1.31	High	3
Overall Mean	3.66	1.20		

Cronbach's Alpha of 0.95 Verbal Interpretation 1.00 to 1.80 Very Low (VL), 1.81 to 2.60 Low (L), 2.61 to 3.40 Moderate (M), 3.41 to 4.20 High (H) and 4.21 to 5 Very High (VH) .

Table 7: Students' Perception on AI Tools in Terms of Adaptability

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The statement *"AI tools provide alternative explanations when I don't understand a concept"* received the highest rating with a mean of 3.73, standard deviation of 1.31, interpreted as high, and ranked 1st. The lowest-rated item was *"AI tools suggest new topics based on my learning progress"*, which had a mean of 3.59, standard deviation of 1.31, also interpreted as high, and ranked 3rd. This supports Sajja et al. (2023), who emphasized that AI-powered intelligent assistants can enhance understanding by delivering customized feedback and content. Adaptability is especially crucial in heterogeneous classrooms, where learners progress at different rates. The lower rating for topic suggestions implies that while students find AI reactive, they may not yet fully utilize or recognize its proactive features.

Efficiency

Statement	Mean	SD	Verbal Interpretation	Rank
AI tools help me complete my schoolwork faster.	3.51	1.29	High	3
AI-generated summaries and explanations save me time.	3.69	1.30	High	1
AI improves my efficiency in solving academic tasks.	3.54	1.25	High	2
Overall Mean	3.58	1.19		

Cronbach's Alpha of 0.95 Verbal Interpretation 1.00 to 1.80 Very Low (VL), 1.81 to 2.60 Low (L), 2.61 to 3.40 Moderate (M), 3.41 to 4.20 High (H) and 4.21 to 5 Very High (VH) .

Table 8: Students' Perception on AI Tools in Terms of Efficiency

The highest-rated item regarding AI's contribution to academic efficiency was *"AI-generated summaries and explanations save me time"*, with a mean score of 3.69 and a standard deviation of 1.30. This was interpreted as high and ranked first among the related indicators. The lowest-rated item, though still positively evaluated, was *"AI tools help me complete my schoolwork faster"*, which had a mean of 3.51 and a standard deviation of 1.29, also interpreted as high and ranked third. These results indicate that students recognize the value of AI in streamlining their academic workload, especially through tools that simplify complex topics and offer time-saving explanations.

This supports the findings of Chen et al. (2022), who emphasized that AI tools significantly improve academic efficiency by reducing the time needed to process complex information and by offering quick, understandable summaries. Similarly, Talan et al. (2022) highlighted that AI-powered platforms support learning by minimizing time spent on content navigation and maximizing focus on key ideas, especially when learners are under time constraints. Kukulska-Hulme (2020) also noted that adaptive AI tools can tailor content delivery to students' individual needs, reducing the cognitive effort required for understanding and allowing more efficient learning paths. These findings collectively reinforce the view that students perceive AI as a helpful academic companion that aids not just in faster task completion but in deeper and more efficient comprehension of learning materials.

Critical Thinking

Statement	Mean	SD	Verbal Interpretation	Rank
AI helps me think critically by providing multiple perspectives on a topic.	3.60	1.29	High	2
AI tools challenge me to analyze information before accepting it.	3.70	1.30	High	1
Using AI tools has improved my problem-solving skills.	3.45	1.25	High	3
Overall Mean	3.58	1.19		

Cronbach's Alpha of 0.95 Verbal Interpretation 1.00 to 1.80 Very Low (VL), 1.81 to 2.60 Low (L), 2.61 to 3.40 Moderate (M), 3.41 to 4.20 High (H) and 4.21 to 5 Very High (VH) .

Table 9: Students' Perception on AI Tools in Terms of Critical Thinking

The top-rated statement was *"AI tools challenge me to analyze information before accepting it"*, with a mean of 3.70 and a standard deviation of 1.30, interpreted as high and ranked first. This suggests that students recognize AI's potential to promote critical thinking and reflective learning. Meanwhile, the lowest-rated item was *"Using AI tools has improved my problem-solving skills"* (M = 3.45, SD = 1.25), also interpreted as high and ranked third. Although students view AI positively, its impact on enhancing problem-solving appears to be perceived as less direct.

These findings are supported by Wang, Huang, and Zhang (2022), who emphasized that AI tools can stimulate analytical thinking by exposing students to diverse perspectives and requiring them to evaluate content before accepting it. AI-driven platforms like intelligent tutors and chatbots often present multiple solutions or viewpoints, encouraging students to think critically rather than passively receive information. However, the slightly lower score for problem-solving may reflect limited student engagement with more interactive AI features that require deeper inquiry. This indicates that while students appreciate the reflective prompts AI provides, more guided use may be necessary to strengthen their problem-solving skills.

Significant Differences in Students' Understanding of AI Utilization Based on Their Profiles

Age

	F	p	Decision	Significance
Personalization	1.29	0.27	Accept Null	NS
Accessibility	1.47	0.20	Accept Null	NS
Adaptability	1.55	0.17	Accept Null	NS
Efficiency	1.11	0.35	Accept Null	NS
Critical Thinking	1.06	0.38	Accept Null	NS

Alpha Value of 0.05

Table 10: Significant Difference in Students' Perception on AI Tools When Grouped According to Age

The analysis showed no significant differences in students' perceptions of AI tools across all learning dimensions when grouped by age. For example, in personalization, the F-value was 1.29 with a p-value of 0.27, and in critical thinking, the F-value was 1.06 with a p-value of 0.38. Since all p-values were greater than 0.05, the null hypothesis was accepted in each case. This suggests that students of different ages perceive AI tools in a similar way. Regardless of age, they found AI beneficial for personalization, critical thinking, and efficiency.

This finding is supported by Rahayu and Putra (2022), who observed that AI platforms deliver adaptive learning experiences that cater to individual needs, regardless of the learner's age. Their study emphasized that AI systems are designed to adjust to users' learning levels rather than demographic factors. As a result, learners tend to have comparable experiences, which may explain the consistent perceptions across age groups in this study.

Grade Level

	F	p	Decision	Significance
Personalization	1.18	0.32	Accept Null	NS
Accessibility	1.16	0.32	Accept Null	NS
Adaptability	1.71	0.17	Accept Null	NS
Efficiency	1.24	0.87	Accept Null	NS
Critical Thinking	1.10	0.35	Accept Null	NS

Alpha Value of 0.05

Table 11: Significant Difference in Students' Perception on AI Tools When Grouped According to Grade Level

When grouped according to grade level, students showed no significant differences in their perceptions of AI tools across all learning dimensions. For example, in adaptability, the F-value was 1.71 with a p-value of 0.17, and in personalization, the F-value was 1.18 with a p-value of 0.32. Since all p-values were greater than 0.05, the null hypothesis was accepted for each dimension. This indicates that students from Grades 7 to 10 generally shared similar views on the usefulness and impact of AI in their education.

This finding is consistent with the study of Muliana and Fithriani (2023), which revealed that students across various educational levels benefited equally from AI tools, particularly in boosting academic productivity. Their research emphasized that the accessibility and functionality of AI applications are effective regardless of a student's grade level. This suggests that AI tools may provide a uniform learning experience that supports students' academic needs across junior high school.

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Sex

	t	p	Decision	Significance
Personalization	-0.3	0.70	Accept Null	NS
Accessibility	0.26	0.79	Accept Null	NS
Adaptability	0.16	0.87	Accept Null	NS
Efficiency	0.47	0.64	Accept Null	NS
Critical Thinking	0.20	0.84	Accept Null	NS

Alpha Value of 0.05

Table 12: Significant Difference in Students' Perception on AI Tools When Grouped According to Sex

The analysis showed no statistically significant differences in students' perceptions of AI tools when grouped according to sex. For instance, in the efficiency dimension, the computed t-value was 0.47 with a p-value of 0.64, while in personalization, the t-value was -0.30 with a p-value of 0.70. Since all p-values were above the 0.05 threshold, the null hypothesis was accepted in all cases. This indicates that both male and female students shared similar views on the usefulness and application of AI in learning.

These results align with the findings of Araka et al. (2022), who reported no notable gender-based differences in students' engagement with or perception of AI-powered educational tools. Their study emphasized that adaptive learning platforms are designed to cater to individual learning needs rather than demographic characteristics, making gender less of a factor in user experience. This suggests that AI tools offer a relatively equal learning opportunity for students, regardless of sex.

Usage

	F	p	Decision	Significance
Personalization	5.08	0.00	Reject Null	S
Accessibility	4.64	0.00	Reject Null	S
Adaptability	6.42	0.00	Reject Null	S
Efficiency	10.06	0.00	Reject Null	S
Critical Thinking	8.42	0.00	Reject Null	S

Alpha Value of 0.05

Table 13: Significant Difference in Students' Perception on AI Tools When Grouped According to AI Usage Frequency

In contrast to other variables, the frequency of AI usage showed statistically significant differences across all learning dimensions. For instance, in efficiency, the F-value was 10.06 with a p-value of 0.00, and in critical thinking, the F-value was 8.42 with a p-value of 0.00. Since all p-values were below the 0.05 threshold, the null hypothesis was rejected in all cases. This indicates that students' perceptions of AI tools varied depending on how often they used them. Those who engaged with AI more frequently reported greater benefits in terms of learning support, efficiency, and critical thinking enhancement.

These findings are supported by Tang and He (2022), who highlighted that regular interaction with AI learning platforms leads to increased user familiarity and more positive academic outcomes. Their study also found that students who frequently used AI tools developed more favorable attitudes toward their educational value. This suggests that consistent exposure may improve both the effectiveness and perception of AI in academic settings.

Issues Encountered by Students in the Utilization of AI in Academics

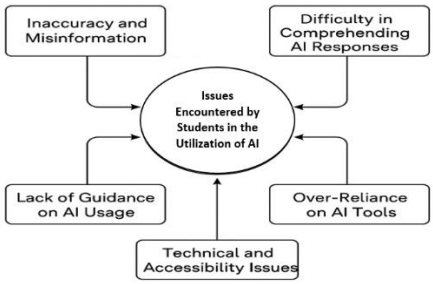

Figure 1: Students Issues Encountered by Utilizing AI in Academics

The study revealed several critical challenges students face when using AI tools for academic purposes, as illustrated in the conceptual model. One major theme is inaccuracy and misinformation. Students frequently expressed that while AI tools like ChatGPT provide fast responses, those answers are not always reliable. For example, one respondent shared, *"Sometimes the answers sound right, but when I check with my textbook, they're actually wrong."* This aligns with findings from the World Economic Forum (2024), which highlights that AI tools often "hallucinate," meaning they generate confidently worded but factually incorrect information, especially in technical subjects like mathematics and science. This issue undermines the trustworthiness of AI as a learning aid and places an extra burden on students to verify responses independently.

Another challenge is the difficulty in comprehending AI responses. Many students mentioned that the content generated by AI was often too complex or not tailored to their level of understanding. One respondent noted, *"I asked a simple question for my grade 10 project, but the AI gave me an answer full of technical terms I didn't understand."* This observation is consistent with Inspera (2024), which explains that AI tools can become ineffective when their responses are too advanced or lack contextual relevance, particularly for younger or lower-level students. When the information is too difficult to grasp, students become frustrated or disengaged, limiting the tool's usefulness as an educational support.A third key issue is the lack of guidance on AI usage. Many students reported that they had not received any training or instruction on how to use AI tools properly, whether for academic integrity or effective learning. As one student remarked, *"Nobody taught us how to use these tools properly—we're just guessing what's okay and what's not."* This supports findings from Southern California Public Radio (2024), which indicate that a lack of AI literacy leaves students unprepared to navigate ethical boundaries and technical usage. Without clear policies or instruction, students are prone to misuse the technology or avoid it altogether due to uncertainty, diminishing its potential to enhance learning.Over-reliance on AI tools also emerged as a significant concern. Some students openly admitted to using AI as a shortcut to avoid effort, with one saying, *"I use ChatGPT to write my essays because it's faster, and I don't have to stress about it."* While such behavior may seem efficient in the short term, research warns against its long-term effects. Inspera (2024) emphasizes that over-dependence on AI may stunt cognitive development and reduce critical thinking abilities. Instead of using AI as a tool for learning enhancement, students risk turning it into a crutch that discourages independent thought and active engagement with academic tasks.Finally, technical and accessibility issues were consistently reported as barriers to effective AI integration in education. Respondents described problems such as unreliable internet access, outdated or incompatible devices, and language limitations. One student explained, *"Sometimes I can't use the AI at home because we don't have good Wi-Fi, and it doesn't understand my local language well."* These practical constraints reflect broader concerns about digital inequality, as documented by EIM Partnerships (2024), which argues that such barriers disproportionately affect students in underserved communities. Without equitable access to both technology and culturally responsive AI tools, the educational benefits of AI remain limited for many learners.

Conclusions

In this study, the use of AI as a learning resource by students is an inevitable event. This can raise some concerns yet that is the reality of this Education 4.0. The level of understanding of using this technology by the students is high in general. This shows that adjustment in the teaching and learning activities will be done by the academic institution in order to adapt to the changing learners' characteristics. The usage of AI tools as learning resources is significantly different in terms of their frequency of usage. This marked a point of action to develop activities, processes and initiatives that will work for the students process and application

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learning.In creating point actions or initiatives, an appropriate model can be utilized. This model is the T3 Framework of Dr. Sonny Magana. It is a model to enhance instructional practices that is divided into 3 parts such as translational, transformational, and transcendent.
These are the initiatives that will help an academic institution (basic education) in using AI as learning resources.
Table 13: Initiatives for se of AI for Students using T3 Framework

	Area	Initiatives	Rationale
Translational	Automation	*AI Guidelines for Basic Education in the Usage for Learning Resources*	This initiative will work on the rules in the utilization of AI as learning resources for students. This will address the issues of lack of guidance on AI usage and over - reliance on AI tools.
	Consumption	*Subscription to AI Tools for Learning Resources*	This initiative will work on the support and full functionality of AI tools to used by the students as a learning resource. This will address the issues of difficulty in comprehending AI responses and technical accessibility issue.
Transformational	Production	*Verification Tools and Process for Report*	This initiative will work on the check and balance of the usage of AI tools of students as learning resources. The process will be facilitated by the faculty. This will address the issue on inaccuracy and misinformation.
	Contribution	*Activities/Tasks Development with the Integration of AI Tools.*	This initiative will work on the activities for teaching in connection to the integration of AI tools as learning resources. The development in the activities will adapt as well in the changing demands of education sector and other industries.
Transcendent	Inquiry Design	*Real – Problem – Solution Tasks Development*	This initiative is developmental activities for faculty and students that aims to make learning meaningful with the aid of AI tools as learning resources. These activities should be more than a submission or completion of subject.
	Social Entrepreneurship	*Dissemination of Product and Performance with the Aid of Learning Resources*	This initiative makes the school activities more than theoretical but more on practicality and purpose to make the society better. This should be aided by AI Tools for dissemination.

These initiatives are proposals to make the AI tools available to students and faculty for learning resources. There should be a dialogue between the administration and researchers for further explanation and discussion of the initiatives.

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