JUSTEK : JURNAL SAINS DAN TEKNOLOGI
http://journal.ummat.ac.id/index.php/justek
ISSN 2620-5475
Vol. 9, No. 1, March 2026, pp. 11-17

Utilization of ChatGPT and Artificial Intelligence in Educational Transformation: Trends, Challenges, and Effects on the Learning Process

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ARTICLE INFO

Article History:

Received : 10-01-2026
Revised : 03-03-2026
Accepted : 12-03-2026
Online : 25-03-2026

Keywords:
Artificial Intelligence (AI);
ChatGPT;
Critical Thinking Ability.

ABSTRACT

This study aims to identify and analyse the relationship between the level of student dependence on Artificial Intelligence (AI) applications, particularly ChatGPT, and its impact on their critical thinking skills, in line with educational transformation issues in the digital era. This quantitative research employed a convenience non-probability sampling approach, involving 112 student respondents in Indonesia. Data were analysed using reliability tests, normality tests, and the Paired Sample T-test. The findings indicate a high level of ChatGPT usage (Mean Score, M = 4.12), confirming students' enthusiasm for utilizing the tool for learning effectiveness and time efficiency. However, the statistical test revealed a significant difference between the level of ChatGPT usage and students' critical thinking ability (Sig. (2-tailed) = 0.009 < 0.05). This difference suggests that excessive reliance on the tool has the potential to impede the development of social and collaboration skills, and may significantly reduce students' learning independence and critical thinking ability. The study concludes that educational institutions must promptly formulate wise policies to guide students in optimally utilizing AI as a learning assistant, not as a substitute for the thinking process to ensure a balanced and sustainable educational transformation.

A. INTRODUCTION

Artificial Intelligence, or AI, is growing really fast. Since it first appeared, more and more people have been paying attention to how AI is used in different areas of life each year. In recent years, several developed countries have started to use AI in education, and this area has been developing quickly. Now, AI is being used in education in many countries. For example, in Australia, a Smart Tutoring System has been developed to help fix the problem of having too many students and not enough teachers (Luckin & Holmes, 2016).

Indonesia is the country in Asia with the most visits to AI-based websites. From 2023 to 2024, the number of visits from Indonesia reached about 1.7 billion times, showing that people there are very interested in using AI in various areas (Network, 2025). AI has made big changes in many sectors, including education (Devi & Rroy, 2023). In today's digital world, AI-based tools are becoming more common in learning activities.

AI has made a big difference in education and learning (Chen et al., 2020). Its impact is seen through learning platforms that match students' needs, virtual learning environments, and materials that fit students' interests and goals. AI-powered learning apps offer a more fun and easy-to-use experience for people of all ages. The use of AI in learning environments also brings new ideas and chances to improve the way education works (Alam, 2021). Educators can take advantage of the insights generated by AI to refine their teaching strategies and thus create a more diverse learning environment (Hardaker & Glenn, 2025; Hasanein & Sobaih, 2023)

AI makes it easier for students to find information, understand class materials, and finish their schoolwork more quickly. In the Islamic Education Management department, many students see ChatGPT as a helpful tool that can improve their learning, save time, and give them fast access to different kinds of knowledge. However, there are worries about students becoming too reliant on technology (Astuti et al., 2023). Using ChatGPT a lot in learning can have both positive and negative effects. On the positive side, it can help students get information faster and understand things better. But if they depend too much on it, it might hurt their ability to think for themselves, learn independently, and interact with others (Purnomo, 2024). This study wants to find out and look at how much students rely on AI tools, especially ChatGPT, and how that affects their ability to think critically, considering the changes happening in education during the digital age.

B. METHODS

This study used a quantitative method to look at how much students depend on AI tools and how that affects their critical thinking skills. A quantitative approach was chosen because it helps collect clear, measurable data, which makes the research findings more trustworthy and accurate (Hardani et al., 2020).

1. Population and Samples

   The population for this study was all students in Indonesia. To choose the right group, the researchers used convenience non-probability sampling (Marwoko, 2019). There were 112 students in total, which was decided based on what is needed for proper statistical analysis and to get results that truly represent the group (Aqib & Murtadlo, 2022).
2. Research Instruments

   The main tool used in this study was a questionnaire. The questionnaire was made using a 5-point Likert scale.
3. Data Collection

   Data was collected online through a survey platform, making it easy for students to complete. The questionnaire was available for one week, and reminders were sent every day to encourage more participation.
4. Data Analysis

   The data was analysed using simple linear regression to see the link between two variables: how much AI is used (X) and the level of critical thinking despite using AI (Y). Pearson correlation tests were used to check the strength and direction of the

relationship between these two variables. A significance test (p-value) was also done to ensure the results are statistically reliable, with a 95% confidence level (α = 0.05).

C. RESULT AND DISCUSSION

1. Result

The results of the study based on data analysis from 112 students with a 17-24 year age range (M=20.89 and SD = 1.98) who were respondents were obtained as follows:

1. Validity Test

   This test shows that the instruments are effective in measuring ChatGPT-related variables and critical thinking ability in a valid and accurate way. All the items related to variable X (which is about using AI, especially ChatGPT) and variable Y (which is about critical thinking skills) have passed the Pearson correlation validity test. The score obtained is higher than the critical value from the r table (0.185), which means the tool is good at measuring what it is supposed to measure.

Table 1. Test the Validity of Variable X

Variable	Item Number	R Count	R Table	P Value	Description
ChatGPT (X)	X.1	1,000	0,185	0,001	VALID
	X.2	0,226	0,185	0,001	VALID
	X.3	0,292	0,185	0,001	VALID
	X.4	0,186	0,185	0,001	VALID
	X.5	0,351	0,185	0,001	VALID
	X.6	0,193	0,185	0,001	VALID
	X.7	0,248	0,185	0,001	VALID
	X.8	0,240	0,185	0,001	VALID
	X.9	0,284	0,185	0,001	VALID

Table 2. Test the Validity of Variable Y

Variable	Item Number	R Count	R Table	P Value	Description
Critical Thinking Skills (Y)	Y.1	0,182	0,185	0,001	VALID
	Y.2	0,233	0,185	0,001	VALID
	Y.3	0,239	0,185	0,001	VALID
	Y.4	0,223	0,185	0,001	VALID
	Y.5	0,225	0,185	0,001	VALID
	Y.6	0,193	0,185	0,001	VALID
	Y.7	0,383	0,185	0,001	VALID
	Y.8	0,255	0,185	0,001	VALID
	Y.9	0,285	0,185	0,001	VALID
	Y.10	0,206	0,185	0,001	VALID
	Y.11	0,256	0,185	0,001	VALID

2. Reliability Test

   The X (ChatGPT) variable had a reliability score of 0.769, and the Y (critical thinking skills) variable scored 0.879. These scores were determined using Cronbach's Alpha method. Both scores are well above the minimum acceptable level of 0.70, which means the tool can measure these variables consistently. This shows that the parts of the tool work well together and can measure both X and Y in a reliable way.

3. Normality Test

To check if the data is normally distributed, a visual method called the Quantile-Quantile Plot was used, as shown in the figure below.

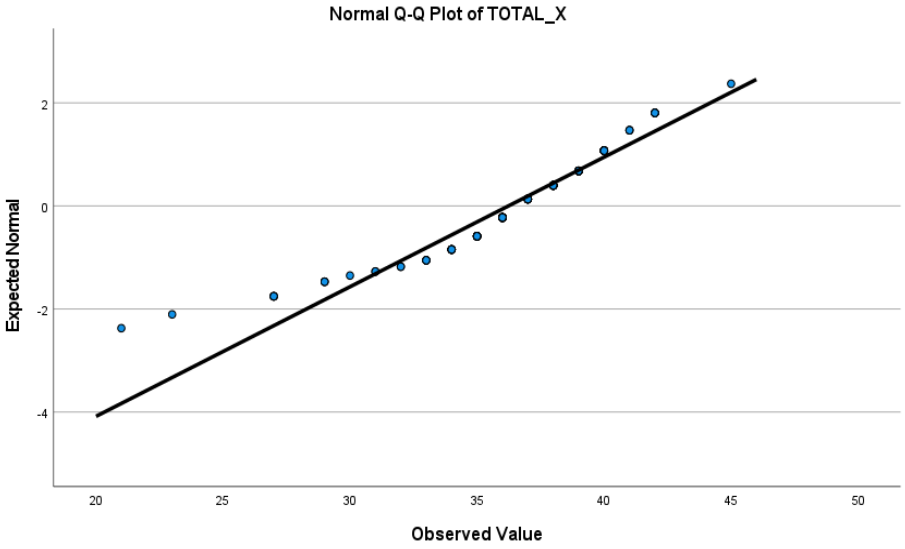

Figure 1. Standardized Residuals Q-Q Plot Curve

Hypothesis:

H0: The data is normally distributed.

H1: The data is not normally distributed.

The results of the plot show that the data points follow a straight diagonal line, especially in the middle. This means the data follows a normal distribution.

4. Paired T-Test

A paired sample T-test was used to check if there is a relationship between X and Y. The test results show a significance value (2-tailed) of 0.009, which is less than 0.05. This means there is a significant difference between X and Y. The average score for X is M = 4.12, and the average score for Y is M = 16.42.

Table 3. Result of Paired T-Test

Variable	N	*Mean*	SD	T	Sig. (2-Tailed)
ChatGPT (X)	112	4,12	0,86	0,009	0,00
Critical Thinking Skills (Y)	112	3,94	0,88		

2. Discussion

This study looks at how much students rely on AI tools, especially ChatGPT, and how that affects their ability to think critically. It also connects to changes happening in education today with the rise of digital technology. Research by García-López et al. (2025) and Haryono et al. (2025) shows that using tech tools in learning can boost critical thinking through teamwork. But while ChatGPT makes it easier to get information, it might also reduce students' creativity if they depend too much on

it(Agustina et al., 2022; Fernández Cerero et al., 2025). Studies have found that ChatGPT can both help and harm students' involvement in critical thinking(’Amala et al., 2023; Mesra et al., 2023; Oliveira et al., 2025; Ungranesia et al., 2025).

The research supports the idea that AI is becoming more common in education. Students use ChatGPT a lot, with an average score of 4.12, showing they find it useful because it saves time and gives access to a lot of information. But there are worries too. The results show a clear link between ChatGPT use and critical thinking skills, with a statistically significant difference (Sig. 2-tailed = 0.009 < 0.05). This means the use of ChatGPT has a real impact on students' ability to think critically. Also, the average ChatGPT score (4.12) is a little higher than the average critical thinking score (3.94), which suggests that using ChatGPT too much could lower students' independence and their critical thinking skills.

In today's world, where digital technology is growing quickly, information and communication technology (ICT) plays a big role in education.
Students need to learn how to use this technology wisely. This study gives a detailed look at how tools like ChatGPT influence critical thinking in college students, which is an important part of their professional development.

This study gives some useful information about how using ChatGPT might affect critical thinking skills, but there are some things we need to be aware of. First, the study used self-reported data, which can be influenced by people's tendency to say what they think is socially acceptable or by their ability to remember accurately. So, future research should use more objective ways to measure ChatGPT use, like looking at browser history or app usage logs.

Second, the study only included 112 students from Indonesia, which makes it hard to apply the findings to other groups. This is because the sample was chosen conveniently, not randomly, which could mean it's not representative of all students in different fields, schools, or areas. Also, the small sample size limits the strength of the statistical results. So, future studies should use proper random sampling and include a wider range of students from various backgrounds and academic areas.

Third, the study is based on a single point in time, which means it can't show cause and effect. We don't know if using ChatGPT more leads to worse critical thinking skills or if students with weaker critical thinking skills are more likely to use AI tools. To better understand this, future research should follow students over time to track how their ChatGPT use and critical thinking skills change, which would help uncover the real relationships between these factors.

D. CONCLUSION AND SUGGESTIONS

This study used a numbers-based method to look at how much students rely on AI tools, especially ChatGPT, and how that relates to their ability to think critically. The study wanted to understand the changes and problems happening in education today because of technology. From data collected from 112 students, the key findings were: The results show that AI, particularly ChatGPT, is becoming very popular in education. On average, students use ChatGPT about 4.12 times, which means they really like using it. They see it as a useful tool that saves time and helps find information. However, even though ChatGPT has good points, the study found a clear link between how much students use it and their critical thinking skills (Sig.(2-tailed) = 0.009 < 0.05). This big difference, along with the fact that students use ChatGPT more than their critical thinking scores (4.12 vs. 3.94), is a worry. If students depend too much on AI without control, it could hurt their social skills, teamwork, and their ability to think for themselves and learn independently.

In the future, schools need to be ready with smart policies. These policies should focus on teaching students how to use ChatGPT in the best way, as a helper, not as a replacement for their own thinking. It's important that students use AI without losing their independence, critical thinking skills, and the chance to interact with others. This helps make sure education changes in the digital age happen in a fair and lasting way.

REFERENCES

Agustina, N. I. M., Ismaya, E. A., & Pratiwi, I. A. (2022). The Impact of Gadget Use on Children's Social Care Character. *Jurnal Basicedu*, *6*, 2547–2555. https://doi.org/10.31004/basicedu.v6i2.2465

Alam, A. (2021). *Possibilities and Apprehensions in the Landscape of Artificial Intelligence in Education* (pp. 1–8). https://doi.org/10.1109/ICCICA52458.2021.9697272

'Amala, Y., Thohir, M., Reditiya, V. E., & Sari, N. I. P. (2023 Students' Reflections on Digital Civility through ChatGPT. *Intelektual: Jurnal Pendidikan Dan Studi Keislaman*, *13*, 109–128. https://doi.org/10.33367/ji.v13i2.3978

Aqib, Z., & Murtadlo, A. (2022). *A–Z Encyclopedia of Innovative Learning Methods*. Penerbit Andi.

Astuti, M., Herlina, H., Ibrahim, I., Rahma, M., Salbiah, S., & Soleha, I. J. (2023). Optimizing the Use of Technology in Islamic Education. *Concept: Journal of Social Humanities and Education*, *2*, 28–40. https://doi.org/10.55606/concept.v2i3.504

Chen, L., Chen, P., & Lin, Z. (2020). Artificial Intelligence in Education: a Review. *IEEE Access*, *8*, 75264–75278. https://doi.org/10.1109/ACCESS.2020.2988510

Devi, D., & Rroy, A. (2023). Role of Artificial Intelligence (AI) in Sustainable Education of Higher Education Institutions in Guwahati City: Teacher's Perception. *International Management Review*, *19*, 2023. https://americanscholarspress.us/journals/IMR/pdf/IMR-0-2023/IMR2023SpringSp-art10.pdf

Fernández Cerero, J., Montenegro Rueda, M., Román Graván, P., & Fernández Batanero, J. M. (2025). ChatGPT as a Digital Tool in the Transformation of Digital Teaching Competence: A Systematic Review. *Technologies*, *13*, 205. https://doi.org/10.3390/technologies13050205

García-López, I. M., González González, C. S., Ramírez-Montoya, M.-S., & Molina-Espinosa, J.-M. (2025). Challenges of implementing ChatGPT on education: Systematic literature review. *International Journal of Educational Research Open*, *8*, 100401. https://doi.org/https://doi.org/10.1016/j.ijedro.2024.100401

Hardaker, G., & Glenn, L. E. (2025). Artificial intelligence for personalized learning: a systematic literature review. *The International Journal of Information and Learning Technology*, *42*, 1–14. https://doi.org/10.1108/ijilt-07-2024-0160

Hardani, Andriani, H., Ustiawaty, J., Utami, E. F., Istiqomah, R. R., Fardani, R. A., Sukmana, D. J., & Auliya, N. H. (2020). *Qualitative and Quantitative Research Methods*. Pustaka Ilmu.

Haryono, H., Ginanjar, F., & Rosyalita, D. (2025). The Effectiveness of Collaborative Learning Strategies in Enhancing Critical Thinking Skills Among General Education Students. *The Journal of Academic Science*, *2*, 1911–1920. https://doi.org/10.59613/tsc9kg32

Hasanein, A. M., & Sobaih, A. E. E. (2023). Drivers and Consequences of ChatGPT Use in Higher Education: Key Stakeholder Perspectives. *European Journal of Investigation in Health, Psychology and Education*, *13*, 2599–2614. https://www.mdpi.com/2254-9625/13/11/181

Luckin, R., & Holmes, W. (2016). *Intelligence Unleashed: An argument for AI in Education*.

Marwoko, G. (2019). Adolescent Developmental Psychology. *Tasyri` : Jurnal Tarbiyah-Syari`ah-Islamiyah*, *26*, 60–75. https://doi.org/10.29138/tasyri.v26i1.69

Mesra, R., Pratiwi, D., Handayani, R., Bagus, I., Suyitno, M., Sampe, F., Halim, F. A., Mayasari, Tri, N., Purwati, H., Ridhani, J., Munandar, H., Tandirerung, V. A., Hamdani, H., & Aina, M. (2023). *Educational Technology*. Sada Kurnia Pustaka.

Network, AJNN. net-A. J. N. (2025). *Indonesia Becomes the Largest AI User in Asia*. https://www.ajnn.net/news/indonesia-jadi-pengguna-ai-terbanyak-di-asia/index.html

Oliveira, L., Tavares, C., Strzelecki, A., & Silva, M. (2025). Thinking Dispositions. *Electronic Journal of E-Learning*, *23*, 1–18. https://doi.org/10.34190/ejel.23.2.3986

Purnomo, S. A. (2024). Islamic Education Management and Artificial Intelligence: Opportunities and Challenges. *Jurnal Alasma: Media Informasi Dan Komunikasi Ilmiah* , *6*, 44–53. https://jurnalstitmaa.org/index.php/alasma/article/view/101

Ungranesia, J. M., Tan, R. N., Lie, D. E., Yosefian, R. I., & Hariyanto, H. (2025). The Influence of ChatGPT on Students' Critical Thinking and Analytical Skills. *Aletheia Christian Educators Journal*, *6*, 73–83. https://doi.org/10.9744/aletheia.6.2.73-83