Correlation Between the Level of Reliability and Ethics with the Perception of the Effectiveness of AI Use in Scientific Paper Writing by Students

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Abstract

In the practice of writing scientific papers, students utilize AI for various purposes that assist and facilitate the process. This study aims to determine the correlation between reliability and ethics with the perception of the effectiveness of AI use in scientific writing by students. The method used in this study is quantitative with a correlational research type. The data collection techniques in this study are observation and survey with questionnaire distribution. The questionnaire used Google Forms and was distributed to 50 students who participated in scientific writing training in high school. Data analysis included normality tests, linearity tests, and correlation tests. The data analysis method used in this study was correlational analysis to determine the relationship between variables using product moment analysis with SPSS 23. The results showed that there was a relationship between the level of AI reliability (X_1) and the perception of the effectiveness of AI use in students' scientific writing (Y) with a correlation value of 0.726. Similarly, the AI ethics variable (X_2) showed a fairly high correlation with the perception of effectiveness (Y) of 0.696. Both correlation values are in the strong correlation category (0.70–0.90), indicating that the higher the reliability and ethics of AI perceived by students, the higher their perception of the effectiveness of AI use in scientific writing.

Keywords: AI, ethics, reliability, scientific papers, students

1. INTRODUCTION

The use of artificial intelligence (AI) in the education ecosystem is currently receiving widespread attention. For example, there are personalized learning solutions, automatic evaluation, learning analytics, and AI tutors (UNESCO, 2025). In addition, more than 47% of learning management systems are supported by AI (Claned, 2024). In learning, teachers utilize AI to design materials, media, and evaluation tools, while students use AI to complete assignments, write scientific papers, search for references, or simply ask questions about things they do not understand. Therefore, AI has become a tool for teachers and students in learning. However, when AI is integrated and utilized in the teaching and learning process, there needs to be infrastructure readiness and digital literacy for its users (Sugiono, 2024).

Students use AI in writing to organize ideas, outline, review references, and correct grammar. Tools like ChatGPT, Grammarly, Gemini, and AI Chatbot help improve writing quality. Students perceive that AI chatbots enhance writing quality but are selective in their application (Maratussholihah et al., 2025). AI chatbots provide personalized guidance with 91% accuracy (Claned, 2024). Reliability, or AI's ability to give quick, consistent, and relevant suggestions, drives student use. However, ethical concerns about academic integrity and plagiarism persist (Side et al., 2024).

AI reliability means consistent, accurate, and relevant recommendations. This depends on training data quality, model transparency, and verification processes. Prompting competence and verification skills are key for content reliability (Sugiono, 2024). Consequently, students' perception of AI effectiveness strongly depends on user experience. More consistent and trustworthy AI recommendations raise effectiveness perceptions (Al Maharmah et al., 2025). Supporting this, students using AI-based adaptive learning programs saw a 62% test score increase (Claned, 2024).

AI ethics is another key factor impacting students perceptions of AI's effectiveness. In this context, ethics include fairness, transparency, accountability, privacy, and academic integrity. Issues include user data privacy, algorithmic bias, plagiarism, and overreliance affecting language and critical thinking (Isdayani et al., 2024). These concerns shape teacher and student perceptions of AI's effectiveness in writing. While AI is helpful, its perceived effectiveness depends on whether it maintains integrity and privacy (Cruvinel Júnior et al., 2025).

Based on direct observations of 50 students participating in scientific writing training at a high school in Jakarta, all students utilized AI for various purposes. Students utilized AI for everything from generating research ideas, collecting data and references, developing scientific paper outlines, and correcting grammar. When selecting AI, students actively sought recommendations for reliable and easy-to-use AI. Students considered reliable AI to be accurate and consistent in providing recommendations and answers. Meanwhile, easy-to-use AI was seen from the appearance and language support aspects. Therefore, considering this fact, the need for appropriate and precise policies or regulations by educational institutions regarding the use of AI is necessary to support the integrity of scientific writing by students.

Relevant studies indicate similar trends in AI use in education. One study discusses Generative AI's potential and need for literacy and policies (Sugiono, 2024). Another shows students use GenAI as multitasking assistants and tutors, highlighting the need for AI literacy (Kim et al., 2025). Teacher AI literacy studies find a link between awareness, ethics,

evaluation, and responsible use (Al-Abdullatif, 2025). Despite these findings, more quantitative research is needed on how reliability and ethics correlate with perceived AI effectiveness in scientific writing. Education requires more effective and ethical AI integration. Based on the background of the problem described above, this study aims to determine the correlation between reliability and ethics with the perception of the effectiveness of AI use in scientific writing by students.

2. LITERATURE REVIEW

2.1. AI Reliability

AI reliability refers to a system's ability to provide accurate, relevant, consistent, and contextually appropriate outputs. AI reliability is one of the important factors that influence user trust in this technology. Furthermore, reliability is not merely a technical aspect, but also relates to trustworthiness, which includes transparency and accountability (Durán & Pozzi, 2025). Although AI can speed up the writing process, the risk of misinformation is still possible, so verification skills are needed (Întorsureanu et al., 2025). Romani et al., (2025) developed an ethical principle-based reliability evaluation framework to ensure that AI meets quality and safety standards. From the students' perspective, the reliability of AI is influenced by their experience in using it, the accuracy of the information provided by AI, and AI's ability to provide relevant and accessible references.

2.2. AI Ethics

AI ethics refers to moral principles such as fairness, transparency, privacy, and academic integrity. AI ethics is a set of moral principles that can help users distinguish between right and wrong. AI ethics relates to issues of responsibility, privacy, fairness, clarity, transparency, supporting human intelligence, and not replacing it (IBM, 2024). Porayska-Pomsta et al., (2024) identified key issues such as privacy violations, algorithmic bias, and potential plagiarism due to uncontrolled use of AI. In view of these issues, digital literacy is necessary for students to understand the ethical limits of AI use (Palma, 2025). Therefore, from the students' perspective, these ethical concerns affect their perception of the effectiveness of AI use. Students remain concerned that their academic writing should not contain elements of plagiarism, violate academic integrity, or compromise privacy.

2.3. Perception of AI Effectiveness

Perceived effectiveness is students' subjective assessment of the extent to which AI helps them write scientific papers efficiently and with high quality. Kim et al., (2025) found that students consider AI to be a multitasking assistant that improves the speed and quality of writing. Students use AI to improve structure and grammar and to search for research ideas (Maratussholihah et al., 2025). However, students remain aware of the risks of inaccurate information, lack of context, and irrelevant information. Claned (2024) emphasizes that AI can improve the personalization of learning, which has an impact on positive perceptions of effectiveness. In this study, the meaning of effectiveness is influenced by the factors of AI reliability and ethics.

3. RESEARCH METHODOLOGY

This study uses a quantitative method with a correlational research design to determine the relationship between variables. According to Creswell (2018), quantitative research is an approach that tests objective theories by measuring variables using research instruments so that numerical data can be analyzed through statistical procedures. The correlational method was chosen with the aim of determining the level and direction of the relationship between the variables under study (Sugiyono, 2017). The subjects of this study were male and female high school students who participated in scientific writing training. The data obtained were processed using Pearson's product-moment correlation analysis, which analyzes the relationship between AI reliability and AI ethics as independent variables with the perception of the effectiveness of AI use as a dependent variable.

The data used in this study is primary data because it was collected directly through a questionnaire distributed via Google Form. The questionnaire used a 1-5 Likert scale. Respondents provided answers ranging from strongly disagree to agree to statements given in the questionnaire regarding the reliability, ethics, and perceived effectiveness of AI use. Sampling was conducted using purposive sampling, which is a sampling technique based on specific criteria. In this study, the criteria used were active high school students who participated in scientific writing training and utilized AI in the writing process. In addition to the questionnaire, the researcher also observed the classroom directly during the training process, which consisted of 12 meetings.

The data obtained from the questionnaire will be processed using SPSS version 23 with validity and reliability tests to ensure the quality of the instrument. The results of the validity test of this study show that all question items are valid. This is evidenced by the calculated r being greater than the table r. The results of the validity test for this study ranged from 0.532–0.899 with an r table of 0.279. Then, based on the reliability test, the Cronbach's alpha value for all variables (0.616–0.858) was greater than 0.60, so it can be said that the questions in all variables were reliable.

After that, the data analysis conducted included normality tests, linearity tests, and correlation tests. The data analysis method used in this study was correlational analysis to determine the relationship between variables using product-moment analysis with SPSS 23 application. The following are the guidelines used in correlational analysis.

Table 1. Correlation Degree Guidelines

Coefficient Interval	Correlation Level
0,00 – 0,199	Very Weak
0,20 – 0,0399	Weak
0,40 – 0,599	Moderate
0,60 – 0,799	Strong
0,80 – 1,000	Very Strong

4. RESULTS

In this study, there were 51 respondents who participated in scientific writing training, consisting of 49% female respondents and 51% male respondents, as shown in Figure 1.
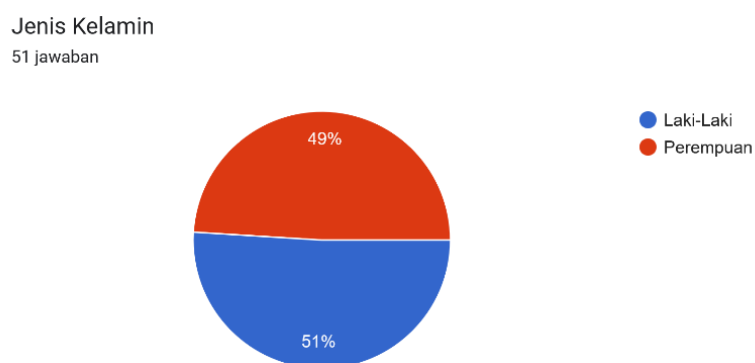
Jenis Kelamin
51 jawaban

Figure 1. Gender of Respondents

Figure 2 shows that the respondents who filled out the questionnaire were mostly 11th-grade students. This is because scientific writing is a mandatory final assignment for 11th-grade students before advancing to 12th grade.
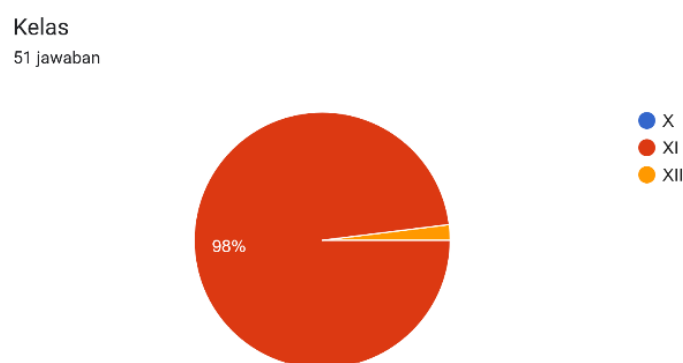
Kelas
51 jawaban

Figure 2. Respondent Class

Based on the results of the observation, the students who participated in the training had already used and utilized AI in scientific writing. This can be seen in Figure 3, where students utilize several types of AI for various purposes. For example, students use it to find ideas, help find references, information, and recommendations, write quotations and bibliographies, check scientific papers, and help write and analyze data.

Based on preliminary surveys, researchers found that students use AI to search for relevant journals or references and collect supporting data for their writing projects. Students can find references from accessible national and international journals. In addition, students also use AI to refine language, check grammar, paraphrase, and organize the structure of their writing to make it more systematic. AI is a tool that helps students get started and find initial ideas, as well as design the framework or initial draft of their writing. Several AI tools are used, such as ChatGPT, Perplexity, and Paperpal, according to the needs of scientific writing.

In selecting the type of AI, students also emphasized the importance of verifying the credibility of sources. Students look for recommendations with good reviews that are widely suggested on social media or receive recommendations from teachers or training instructors. In addition, students also understand specific prompt writing practices and then compare the outputs of several AIs they use. Students choose the one that is most relevant to their needs and continue to edit manually so that they remain involved and in line with the rules of scientific writing. Considerations include the AI's reputation, ease of

use, accuracy of information, and completeness of data and analysis. Students continue to pay attention to the importance of originality by including appropriate and relevant citations and references. Therefore, AI is positioned as an academic support that facilitates and expands the scope of research while maintaining integrity and originality.
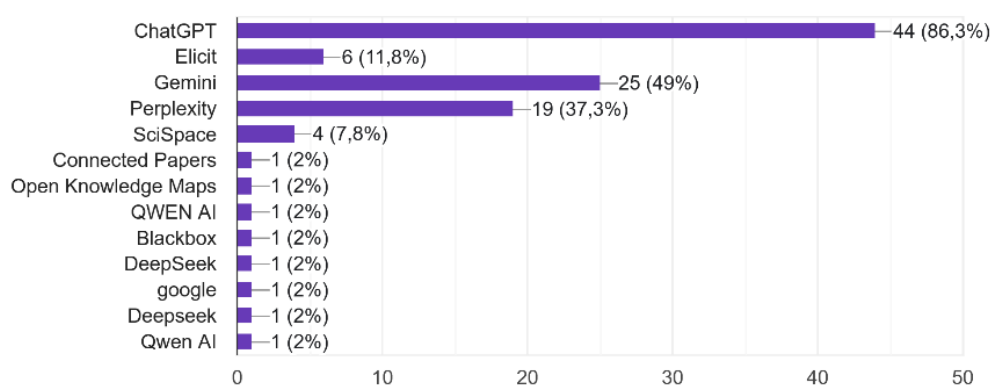

Figure 3. Types of AI

In Figure 3, it is evident that ChatGPT is the most popular AI among students, reaching 86.3%. This is followed by Gemini (49%), Perplexity (37.3%), Elicit (11.8%), and SciSpace (7.8%). The remaining 2% of students use other AI tools, such as Connected Papers, Open Knowledge Maps, Qwen AI, and DeepSeek.

Table 2. Normality Test

		Unstandardized Residual
N		50
Normal Parameters	Mean	0.0000000
	Std. Deviation	3.09994179
Most Extreme Differences	Absolute	0.075
	Positive	0.075
	Negative	-0.072
Test Statistic		0.075
Asymp. Sig. (2-tailed)		0.200

Decision criteria using the Kolmogorov-Smirnov statistical test are as follows:

a. If significance > 0.05, then the data is normally distributed.
b. If significance < 0.05, then the data is not normally distributed.

Based on the results of the normality test, it can be concluded that the residual values of the research data are normally distributed. Table 2. One-Sample Kolmogorov-Smirnov Test shows a significance value of 0.200. Because the Kolmogorov-Smirnov significance value of 0.200 > 0.05, it can be concluded that the data is normally distributed. Next, the researcher conducted a classical assumption test by performing a linearity test. The results of the linearity test can be seen in Table 3.

Table 3. Linearity Test

		Anova Tabel				
		Sum of Squares	df	Mean Square	F	Sig.
Persepsi Efektivitas * Etika AI	Between Groups (Combined)	730.845	14	52.203	3.842	0.001
	Linearity	583.774	1	583.774	42.963	0.000
	Deviation from Linearity	147.071	13	11.313	0.833	0.625
	Within Groups	475.575	35	13.588		
	Total	1206.420	49			

Table 3 shows the results of the linearity test using SPSS. The linearity test aims to determine the relationship between variables. The results of the linearity test from the deviation from linearity show a value of 0.625 > 0.05. It can be concluded that the two variables are linear. After the data is normally distributed and has a linear relationship, a hypothesis test with the product-moment correlation is performed. The correlation test results are shown in Table 4.

Table 4. Correlations Test

		Reliability	Ethics	Perception of the Effectiveness
Reliability	Pearson Correlation	1	0.661**	0.726**
	Sig. (2-tailed)		0.000	0.000
	N	50	50	50
Ethics	Pearson Correlation	0.661**	1	0.696**
	Sig. (2-tailed)	0.000		0.000
	N	50	50	50
Perception of the Effectiveness	Pearson Correlation	0.726**	0.696**	1
	Sig. (2-tailed)	0.000	0.000	
	N	50	50	50

The results of the product-moment correlation test (Pearson Correlation) in Table 4 show that there is a relationship between the level of AI reliability (X1) and the perception of the effectiveness of AI use in students' scientific writing (Y), with a correlation value of 0.726. Similarly, the AI ethics variable (X2) shows a fairly high correlation with the perception of effectiveness (Y) of 0.696. Both correlation values are in the strong correlation category (0.70–0.90), indicating that the higher the reliability of AI and AI ethics perceived by students, the higher the perception of the effectiveness of AI use in scientific writing. It can also be interpreted that technical and ethical aspects in the use of AI play an important role in its utilization in education.

5. DISCUSSION

AI has become an application that can help generate, edit, and improve writing (Deep, 2025). However, AI presents new challenges that affect students' perceptions of academic integrity, especially in scientific writing (Lund et al., 2025). In the use of AI, ethical issues are a concern, as students become dependent on these applications (Zhai et al.,

2024). Understanding the ethics of AI use in academia is important to note (Lund et al., 2025). AI ethics in academia can be linked to clear policies, such as restrictions on the use of AI. These ethics also become an important dimension in shaping student integrity in the use of technology. This means that AI technology is not something to be avoided, but rather a tool that can help and facilitate the process of writing scientific papers. If students understand these ethics, there is no need to worry about possible cheating.

The reliable and wise use of AI can improve learning outcomes and processes. AI can assist students in writing, provide personal guidance or discussion, and reduce the cognitive load in the process of writing and revising scientific papers (Deep, 2025). Students can choose a more practical, faster, and more efficient path, especially using AI, even though there are ethical issues that need to be considered (Zhai et al., 2024). The existence of these ethical considerations proves that there is still skepticism among students regarding cheating in scientific writing (Lund et al., 2025). AI ethics are an important moral foundation that plays a role in determining users' attitudes towards this technology.

Teachers are also concerned that the use of AI affects students' critical thinking skills (Deep, 2025). The use of AI has an impact on cognitive abilities and critical thinking skills because students prefer quick and practical solutions (Zhai et al., 2024). Writing scientific papers supported by AI can be done quickly and easily to produce complete papers, so that sometimes students do not need to do much else (Deep, 2025). Over-reliance on AI occurs when users accept AI-generated recommendations without checking and questioning them (Zhai et al., 2024).

The use of AI technology in learning should be directed towards improving a better and more meaningful learning experience for students (Mujiono, 2023). AI can support learning and self-improvement if integrated appropriately. AI-supported learning still pays attention to the aspect of integrity (Deep, 2025). The importance of regulation and ethical guidance in the use of AI cannot be ignored. There needs to be a policy from educational institutions on the ethical use of AI and the establishment of trust in its use (Mustofa et al., 2025). Ethics and reliability are important aspects to consider in the use of AI. Ethical AI design is essential to ensure responsible use and build user trust (Hagendorff, 2020).

The ethics and reliability of AI are not only technical aspects, but also impact users' perceptions of the technology's effectiveness. These two factors complement each other, forming a positive perception of its acceptance and effectiveness. This study shows that the reliability and ethics of AI contribute significantly to students' perceptions of its effectiveness in scientific writing. In addition, the results of this study can be used as a basis for developing policies in the world of education regarding the use of AI. Appropriate policies can guide the responsible use of AI and provide proper guidance on the use of AI in the learning process.

6. CONCLUSION

Based on the results of the study, there is a relationship between the level of AI reliability and the perception of the effectiveness of AI use in students' scientific writing. Similarly, the AI ethics variable shows a fairly high correlation with the perception of effectiveness. Both correlation values are in the strong correlation category, indicating that the higher the reliability of AI and AI ethics perceived by students, the higher the perception of the effectiveness of AI use in scientific writing. It can also be interpreted that

technical and ethical aspects in the use of AI play an important role in its utilization in education.

The reliability of AI is an important factor that shapes users' perceptions of its effectiveness, from the selection of AI types to the recommendations it provides. The reliable and wise use of AI can improve learning outcomes and processes. AI can assist students in the process of writing and revising scientific papers. In addition, students' perceptions of the ethics of AI use also influence their assessment of its effectiveness. Thus, the reliability and ethics of AI must go hand in hand to generate positive perceptions.

With the findings in this study, it is hoped that students will be guided to use AI more wisely, effectively, and responsibly. In addition, teachers can also design assessments and policies for the use of AI in the classroom learning process that still emphasize academic integrity. Furthermore, training and ethical guidelines are needed so that students and teachers are better prepared to utilize AI.

REFERENCES

Al-Abdullatif, A. M. (2025). Auditing AI Literacy Competency in K–12 Education: The Role of Awareness, Ethics, Evaluation, and Use in Human–Machine Cooperation. *Systems*, *13*(6). https://www.mdpi.com/2079-8954/13/6/490

Al Maharmah, A., Elfeky, A., Yacoub, R., Ibrahim, A., & Nemt-allah, M. (2025). Measuring ethical AI Use in higher education : Reliability and validity of the AI academic integrity scale for postgraduate students. *International Journal of Innovative Research and Scientific Studies*, *8*(4), 707–715. https://doi.org/10.53894/ijirss.v8i4.7928

Claned. (2024). *The Role of AI in Personalized Learning*. https://claned.com/the-role-of-ai-in-personalized-learning/

Creswell, J. W. (2018). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (Fifth Edit). SAGE Publications, Inc.

Cruvinel Júnior, L., Orrillo Ascama, H. D., & Marques da Silva, M. (2025). Ai ethics in higher education. *Ethical and Social Impacts of Information and Communication Technology*, 1–12. https://link.springer.com/chapter/10.1007/978-3-032-01429-0_17

Deep, P. Das. (2025). The Role of AI in Academic Writing: Impacts on Writing Skills, Critical Thinking, and Integrity in Higher Education. *Societies*, *15*, 1–19. https://doi.org/10.3390/soc15090247

Durán, J. M., & Pozzi, G. (2025). Trust and Trustworthiness in AI. In *Philosophy & Technology* (Vol. 38, Issue 1). Springer Netherlands. https://doi.org/10.1007/s13347-025-00843-2

Hagendorff, T. (2020). The Ethics of AI Ethics : An Evaluation of Guidelines. *Minds and Machines*, *30*(1), 99–120. https://doi.org/10.1007/s11023-020-09517-8

IBM. (2024). *Apa itu etika AI?* https://www.ibm.com/id-id/think/topics/ai-ethics

Întorsureanu, I., Oprea, S., & Adela, B. (2025). Generative AI in Education : Perspectives Through an Academic Lens. *Electronics*, *14*(5). https://doi.org/10.3390/electronics14051053

Isdayani, B., Thamrin, A. N., & Milani, A. (2024). Implementasi Etika Penggunaan Kecerdasan Buatan (AI) dalam Sistem Pendidikan dan Analisis Pembelajaran di Indonesia. *Digitech*, *4*(1), 714–723. https://jurnal.itscience.org/index.php/digitech/article/view/4512/3479

Kim, J., Yu, S., Detrick, R., & Li, N. (2025). Exploring students' perspectives on Generative

AI - assisted academic writing. *Education and Information Technologies, 30,* 1265–1300. https://doi.org/10.1007/s10639-024-12878-7

Lund, B. D., Lee, T. H., Mannuru, N. R., & Arutla, N. (2025). AI and Academic Integrity: Exploring Student Perceptions and Implications for Higher Education. *Journal of Academic Ethics, 23*(3). 10.1007/s10805-025-09613-3

Maratussholihah, Z., Sodiq, S., & Yuniseffendri. (2025). Persepsi siswa terhadap pengintegrasian AI dalam meningkatkan keterampilan menulis karya ilmiah. *Jurnal Bahasa,* 146–159. https://jurnal.unimed.ac.id/2012/index.php/kjb/article/view/67129

Mujiono. (2023). Educational Collaboration: Teachers and Artificial Intelligence. *Jurnal Kependidikan, 9*(2), 618–632. https://doi.org/10.33394/jk.v9i2.7801

Mustofa, R. H., Kuncoro, T. G., Atmono, D., Hermawan, H. D., & Sukirman. (2025). Extending the technology acceptance model: The role of subjective norms, ethics, and trust in AI tool adoption among students. *Computers and Education: Artificial Intelligence, 8,* 100379. https://doi.org/10.1016/j.caeai.2025.100379

Palma, T. Y. (2025). *Artifisial Intelligence Dalam Pendidikan : Kajian Literatur Mengenai Dampak Inovatif Dan Implikasi Moral. 10*(11), 9146–9154. https://jurnal.syntaxliterate.co.id/index.php/syntax-literate/article/view/62284

Porayska-Pomsta, K., Holmes, W., & Nemorin, S. (2024). The Ethics of AI in Education. In B. du Boulay, A. Mitrovic, & K. Yacef (Eds.), *Handbook of Artificial Intelligence in Education.* Edward Elgar Publishing. 10.4337/9781800375413.00038

Romani, G., Avendaño, C., & Santisteban, J. (2025). MESIAS : a web-based platform rooted in ethical principles for evaluating trustworthiness in AI projects. *Frontiers, December,* 1–16. https://doi.org/10.3389/fcomp.2025.1694979

Side, S., Putri, S. E., Zubair, S., & Ilyas, N. M. (2024). Pelatihan Pemanfaatan Artificial Intelligence (AI) dalam Penulisan Artikel Ilmiah Pada Guru SMAN 11 Kabupaten Pangkep. *SMART: Jurnal Pengabdian Kepada Masyarakat, 4*(1), 58–65. https://ojs.unm.ac.id/smart/article/view/61392/26880

Sugiono, S. (2024). Proses Adopsi Teknologi Generative Artificial Intelligence dalam Dunia Pendidikan : Perspektif Teori Difusi Inovasi Adoption Process of Generative Artificial Intelligence Technology in Education : Diffusion of Innovation Theory Perspective. *Jurnal Pendidikan Dan Kebudayaan, 9*(1). https://doi.org/10.24832/jpnk.v9i1.4859

Sugiyono. (2017). *Metode Penelitian Kuantitatif, Kualitatif, dan R&D.* CV Alfabeta.

UNESCO. (2025). *Guidance for generative AI in education and research.* https://www.unesco.org/en/articles/guidance-generative-ai-education-and-research

Zhai, C., Wibowo, S., & Li, L. D. (2024). The effects of over - reliance on AI dialogue systems on students ' cognitive abilities : a systematic review. *Smart Learning Environments, 11*(28). https://doi.org/10.1186/s40561-024-00316-7