Journal of Research, Review and Educational Innovation
Volume 3 Nomor 3 2025, page: 53 - 65
STKIP PGRI Situbondo @2023
DOI. https://doi.org/10.47668/jrrei.v1i1.2185

ANALYSIS SYSTEMATIC POTENTIAL AND IMPACT OF IMPLEMENTATION INTELLIGENCE ARTIFICIAL IN INDONESIAN EDUCATION FROM ELEMENTARY SCHOOL LEVEL TO COLLEGE

Muhaimin Iskandar[1], Mahfud[2], M Anton[3], Sandi Rohmatullah A[4], Rahmat Shofan Razaqi[5*]
[1,2,3,4,5]Information Technology Education Study Program STKIP PGRI Situbondo, Indonesia
email: fanslaught@gmail.com

Abstract: Research This evaluates the potential, impact, and challenges of implementing intelligence in Indonesian education through a PRISMA-based Systematic Literature Review (SLR). A Publish or Perish search yielded 135 published articles. From 2020 to 2025, after screening the titles, abstracts, and focus levels of education, 16 articles were deemed worthy of analysis. The results show that AI provides benefits at different levels. At school, basic AI is used for exercise, reading, and numeracy interaction. However, it brings up risks of personal data exposure, algorithmic bias, and dependency on devices. In junior high schools, 87.40% use AI for various tasks, including learning mathematics and language, which affects academic performance. In high school, 74–75% of students feel comfortable and more motivated to study AI-based. In vocational schools, the use of AI for vocational simulations increases digital literacy and readiness by up to 47.44%. At college high, AI strengthens study collaboration and personal feedback return, but increases the risk of plagiarism and academic challenges identified as main gaps in internet infrastructure, low digital literacy among educators, limitations of devices, a lack of regulations and ethical limitations, potential abuse, as well as inequality in access for students with low incomes. Therefore, there is a need for policy ethics, teacher training, student digital literacy, and investment in networks and devices to ensure inclusive, safe, and sustainable adoption of AI in national systems education.

Keywords: Artificial Intelligence, Indonesian Education, Systematic Literature Review (SLR), Personalized Learning, Digital Literacy.

INTRODUCTION

In today's digital era, Artificial Intelligence has become one of the most innovative and revolutionary technologies, with the potential to transform various aspects of human life, including education. Artificial Intelligence, capable of analyzing large data sets quickly and responsively and of delivering personalized responses, offers an excellent opportunity, especially in activities such as studying, teaching, and providing more engaging, efficient, and inclusive experiences. For example, a teacher in a school-based setting can utilise AI tools to adapt lesson materials to individual students' abilities, increasing engagement and understanding. (YB Widodo et al., 2024) . Global research shows that AI can speed up learning through simulation and interactive feedback, which not only supports cognitive skills but also develops skills in the 21st century, such as creativity and problem-solving. (Selwyn, Smith, et al., 2023). In Indonesia, where traditional values often limit education, AI has the potential to become a catalyst for the modernization of the education system, in line with global trends, as described by UNESCO. (2021b) About AI as a tool for developing sustainability.

However, implementing AI in Indonesian education is not straightforward, especially amid a challenging infrastructure that is still unevenly distributed. Challenges align with findings from Seituni and Akbari (2021), who emphasized that the effectiveness of online learning in Indonesia is greatly influenced by the readiness of digital infrastructure, literacy, and technology, as well as by educators' and participants' education. This country faces limitations, including limited internet

STKIP PGRI Situbondo @2023
DOI. https://doi.org/10.47668/jrrei.v1i1.2185

access in rural areas, the digital divide between urban and rural areas, and a lack of technology literacy among educators and students(Lukman & others, 2023; Sutrisno & others, 2021). In addition, the risk gap social can be widened, as students from low-income families cannot access AI technology, which exacerbates the disparity in education (Kasneci & others, 2023). Pratama et al. (2024) emphasize that without adequate investment in infrastructure, AI's potential to improve the quality of education in Indonesia may be hampered, especially at the elementary and secondary levels. Therefore, a deep analysis of the potential and impact of AI is needed, from high school through college, to ensure that technology not only follows global trends but is also tailored to Indonesia's local context.

AI's potential is evident across various levels of education, with applications aligned with needs. At the school medium vocational (SMK), AI can help students develop study and technical skills through virtual simulations, which are highly relevant to the preparation for the Industry 4.0 era. (Pratama et al., 2023). This is reinforced by the findings of Jagad Muhammad et al. (2025)This shows that the use of intelligent ChatGPT by vocational school students can increase the quality and efficiency of writing reports in Practice Field Work (PKL) in general, although it also raises risks and ethical concerns, such as plagiarism and dependence on technology. In research conducted by Rahman, (2022) Highlight how AI can make learning more interactive at the basic school level, though limited by infrastructure constraints. While at college, AI supports big data analysis for research and learning collaborative, building relevant character and skills with the local culture. (Sholihatin & others, 2023). Research addition as done by Wulandari (2020) Show that AI can emphasize collaboration over individual competition, which aligns with Indonesian culture. Thus, AI is not only a knowledge-transfer tool but also a means of fostering holistic and contextual education.

Although its potential is enormous, AI also brings necessary risks to be aware of, such as ethical issues, plagiarism, and dependence on technology that can reduce the ability to think critically. In Yusuf's research (2025)It is disclosed that, without supervision, students may rely on AI to complete tasks, which erodes their analytical skills. At college, high risk . This is more real, as students often use AI to plagiarize, which could undermine academic integrity in the research conducted by Selwyn et al. (2023)It is noted that the bias of AI algorithms, which are often based on Western data, can cause inaccuracies in the context of Indonesian culture, such as language learning or social marking. Therefore, educators, makers, policymakers, and parents need insight so that AI implementation not only follows global trends but also considers bandwidth limitations in remote areas and values a culture that emphasizes collaboration.

Based on analysis of various articles, the study results show that AI potential stands out more at the higher education level, while having a more negative impact at the basic level—for example, Widodo et al. (2024)Reported that in high school, personalized learning with AI enhanced the motivation of students up to 30% based on a survey of 200 respondents. In vocational schools, Sholihatin et al. (Sholihatin & others, 2023) Find that simulation-based vocational education with AI saves time and improves student productivity by 25%. However, in college, Kasneci & others (2023a) Found 40% of students using AI for plagiarism, reducing analytical ability. At the basic level, data privacy is more crucial, with a risk of leakage from an unsafe algorithm. Deep analysis reveals a pattern: cultural bias in AI can cause inaccuracies, and gaps in infrastructure make things worse, with a more negative impact as the level increases, making it harder to adapt.

Overall, study the literature. This aim is to delve into the deep potential and impact of implementing AI in Indonesian education, from the school level to the college level, with a focus on digital literacy, regulation, and local adaptation research. This is expected to provide

STKIP PGRI Situbondo @2023
DOI. https://doi.org/10.47668/jrrei.v1i1.2185

stakeholders with an outlook to maximize the benefits of AI while minimizing risk, so that Indonesian education can develop sustainably and inclusively in the digital age.

METHOD

This study applies the Systematic Literature Review (SLR) method, adapting the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines, to examine the potential and impact of implementing artificial intelligence (AI) in education in Indonesia. This method is considered the most appropriate because it systematically and measurably identifies, classifies, and analyzes the potential and impact of AI implementation. The PRISMA-based research approach includes several main stages, namely: (1) Identification, (2) Screening, (3) Eligibility, and (4) Inclusion. (Simamora, 2024). Flowchart stages study the presentation in the picture following.

Figure 1. Prism Research Steps

Identification

At this stage, the identification process uses relevant literature with the Publish or Perish app—search for articles using previously set keywords to identify appropriate sources with a focus on the study. (Page et al., 2021).

Screening

After the identification process is finished, the next stage is screening. At this stage, the collected literature has been selected to determine whether each article meets the inclusion and exclusion criteria. This process involves reviewing the title and abstract of every article to ensure relevance and suitability for the focus study. (Polanin et al., 2019).

Eligibility

At this stage, articles that have passed the screening process are analyzed in more depth to examine the overall content. This step aims to evaluate the quality and relevance of every article in a more comprehensive way, so that it can be confirmed that all the articles fulfil the set methodological requirements. (Page et al., 2021).

Included

Articles that have passed the latter eligibility stage are analyzed at this stage. This is for formulating a conclusion on the potential and impact of implementing artificial intelligence (AI) in education in Indonesia. (Sabbah et al., 2023).

The eligibility criteria included articles in the study. This is presented in Table 1 below, which contains details about the requirements for inclusion and exclusion of articles:

Table 1. Criteria Article Retrieval and Exclusion

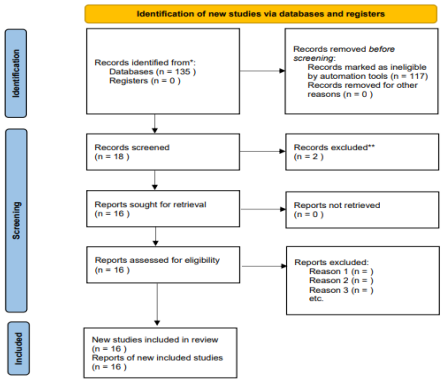
Criteria	Inclusion	Exclusion
Year Publication	Article published in the last 5 years (2020-2025)	Published articles before 2020

STKIP PGRI Situbondo @2023
DOI. https://doi.org/10.47668/jrrei.v1i1.2185

Publication Type	Journal articles, proceedings, conferences, and reports, research that has been directed in an academic way	Article in the form of opinion, review, general, or editorial
Language	English language articles, English or Indonesian	Articles written in languages besides English and Indonesian
Subject Study	Focus on participants' educational level: elementary, middle, high school, and college.	Focus on students, not the educator.
Research result	Articles that discuss the potential and risks of using AI in environmental education, elementary, intermediate, first, middle, top, and college.	Articles that do not discuss the potential and risks of using AI in elementary, intermediate, first, middle, top, and college-level education.
Accessibility	Articles with access full	Articles that only have an abstract or are not available in text form

RESULT

After the literature search using keywords specific to the Publish or Perish application, as many as 135 articles were obtained. Next, filtering was carried out using Microsoft Excel based on title, abstract, and level of education, resulting in 117 excluded articles that did not meet the criteria. Of the 18 articles, 18 remained relevant. However, two of them were excluded because they did not meet the eligibility criteria. Stage end done with review: 16 articles in form text are complete and set as final articles for further analysis. A flow diagram of the channel selection literature is presented in Figure 2.



Gambar 2. Flowchart Preferred Reporting Items for Systematic Review and Meta-Analysis

A total of 16 articles have been selected and reviewed comprehensively to answer the study question. The analysis results for 16 articles are shown in Table 2.

Table 2. Article Analysis Results

STKIP PGRI Situbondo @2023
DOI. https://doi.org/10.47668/jrrei.v1i1.2185

No	Author Name & Year Rise	Method	Level	Measured Aspects	Research result
1.	Thomas (2025)	Quantitative	Gracia High School	Introduction and utilization of AI by students in learning: impact on engagement, understanding, and academic performance.	AI improves motivation and enthusiasm among students; 74% of students are comfortable using AI, and 75% are more likely to study with it, indicating integration is positive in high school.
2.	I Made Sujana, Agus Saputra, Bonista Z. Melani, La Ode Alfin H. Munandar1, and Andra A. Riyanto (2023)	Quantitative	Mataram Middle School	The effectiveness of AI (such as ChatGPT) in the development module benefits innovative and engaged students.	AI improves development modules and experiences—study interactive, impactful, positive results on education in junior high school.
3.	Eri Bayu Pratama, Ade Hendini, Yanto, Wahyutama Fitri Hidayat (2023)	Qualitative	Junior High School (YAWIKA)	Understanding educators about AI: the potential of AI for personal learning and concerns (bias, dependency).	AI improves students' motivation and habits. Study independently; function as a virtual tutor for more efficient results in junior high school.
4	Ibnu Ikhsan, Putu Artasoma, Eli Karliani, Ali Sunarno (2025)	Qualitative	State Junior High School 8, Palangka Raya	The use of AI for assignments (Mathematics /Indonesian); benefits (access fast) vs. challenges (dependence, decline in critical thinking).	87.40% of students who use AI for tasks improve learning outcomes; a necessary balance to avoid risks in junior high school.

STKIP PGRI Situbondo @2023
DOI. https://doi.org/10.47668/jrrei.v1i1.2185

5	Susanto, Ari Kriswinarti, Yuzi Hana Christiani, Yohanes Bahari, Warneri (2024)	Qualitative	Shepherd Junior High School/Senior High School	The potential of AI in settlement tasks; impact positive (increase) tasks vs. negative (dependence, laziness); awareness of students.	100% of students are AI-aware; 61% use ChatGPT/Gemini . They help with tasks but need supervision to reduce the negative impact in junior high/high school.
6	Praharisti Kurniasari, Agusti Mardikaningsih , Reno Siska Sari (2025)	Quantitative	Insan Budi Utomo University	Dependence of students on AI for academic tasks; impact on critical thinking and creativity.	AI improves engagement and outcomes in learning, but reliance on AI increases the risk of reduced analytical thinking skills at university.
7	Mitra Rahayu, Jeffri Parrangan, Febry Ramadhani Suradji (2025)	Qualitative	Anim Ha Merauke State Junior High School/Senior High School	The potential of AI for education is unique: it improves teacher-student understanding and engagement through interactive applications.	AI improves teacher competence and motivates students; it creates an adaptive environment, even though there are infrastructure limitations in junior high/high schools with special needs.
8	Endah Tri Utami, Mintasih Indriay (2025)	Quantitative .	State Senior High School 1 Karanganyar	Influence convenience usage, results learning, and social intentions using AI; gender roles.	Expected results: positive influence on intention; influence socially important; convenience increases adoption in high school.

STKIP PGRI Situbondo @2023
DOI. https://doi.org/10.47668/jrrei.v1i1.2185

9	Harmilawati, Rifqatussa'diyah , Putri Amalia, Husaini Amaliyah Majid, Izza As Sahrah (2024)	Qualitative	Ahmad Dahlan Islamic University	The potential of AI for skills, critical thinking, accessing sources, personalization, and collaboration has both positive/negative impacts (dependence, ethics).	AI improves critical thinking and PBL, a necessary balance to minimize risks at university.
10	Nelvia Susmita, M. Zaim, Harris Effendi Thahar, Sinta Wahyuni (2024)	Quantitative	State Senior High School 2 Sungai Penuh	The potential of AI in learning Indonesian: familiarity, optimism, and concerns (dependence, privacy).	The majority of students are familiar and optimistic; AI improves understanding, but adoption of low-risk privacy practices in high school remains low.
11	Ahmad Taufik, I Ketut Sudaryana, Goldie Gunad, Tupan Tri, Agus Budiyantara, Rouli Doharma (2025)	Qualitative	Dasana Indah Tangerang Informatics Media Vocational School	The potential of AI (ChatGPT) for digital literacy, creativity, and understanding language, involving students.	Training increases understanding and independence; enthusiasm for studying at a vocational school is high.
12	Neny Rosmawarni, Rido Zulfahmi, Rudhy Ho Purabaya, Tri Rahayu, Indra Permana Solihin, Yudi Nur Supriadi (2025)	Qualitative	State Vocational School 1 Indramayu	The potential of AI to understand students and foster interactive, personal independence in technology.	50.3% of students believe in self-directed use of AI; improving innovation learning at SMKN.
13	Hey Julyati Hisyam, Mayang Puti Seruni, Aline	Qualitative	East Jakarta Middle School	The potential of AI for skills, thinking critically, literacy, and ethics; risks	AI improves efficiency but risks plagiarism; there is a

STKIP PGRI Situbondo @2023
DOI. https://doi.org/10.47668/jrrei.v1i1.2185

	Nikita, Fairuz Dhiya Putri, Nadya Petricia Lubis, Selvy Gita Cahyani, Sifah Fauziah, Tiara Purnamasari (2025)			plagiarism and dependency.	necessary ethical intervention in junior high school.
14	Kurniahtunnis, Maria Yasinta Manuel, Mellyatul Aini, Tika Putri Agustina (2024)	Quantitative	RUSHD High School of Excellence	Students' perception of AI (ChatGPT) for writing/assignments ; impact on critical thinking and dependency.	88.9% of students use AI for essays; 67% report an increase in thinking critically, but 58% worry about dependence in high school.
15	Mohammad Yahya , Hidayat , Wahyudi , (2023)	Qualitative	State Vocational School 5, Malang City	The potential of AI in education, vocational, personalization, learning, and adaptation for Industry 4.0.	AI improves students' readiness; training programs increase understanding by 47.44% in vocational schools.
16	Yohanes Bowo Widodo, Sondang Sibuea, Mohammad Narji (2024)	Mixture	Mohammad Husni Thamrin University	The potential of AI for personal learning, engagement, process acceleration, and feedback comes back.	AI improves personal experience and engagement, but it also requires teacher training and university infrastructure.

DISCUSSION

Before discussing the research findings, it is important to understand two main concepts: potential and impact. Potential refers to the positive opportunities or possible benefits that may arise before the implementation of an innovation, in this case, artificial intelligence (AI) in education. Potential is prospective because it describes what could be achieved if AI is implemented effectively. Conversely, impact is the tangible result, both positive and negative, that occurs after the implementation is carried out. Impact is empirical and measurable, reflecting the

STKIP PGRI Situbondo @2023
DOI. https://doi.org/10.47668/jrrei.v1i1.2185

extent to which AI application concretely influences the learning process. Thus, potential highlights development opportunities, while impact emphasizes the actual consequences of AI implementation in the education world.

The final results of the analysis of 16 selected articles through the Systematic Literature Review (SLR) method based on PRISMA guidelines indicate that the implementation of AI has great potential to improve the quality of education in Indonesia, from elementary to higher education levels. The main potential lies in AI's ability to personalize learning, increase student engagement, and develop 21st-century skills that are important in a global context. At the middle and high school levels, AI has proven effective in boosting students' motivation and enthusiasm for the learning process. Thomas's (2025) research at Gracia High School found that 74% of students felt comfortable using AI and 75% preferred learning with it, which impacted increased engagement and academic achievement. This finding is reinforced by the research of I Made Sujana et al. (2023) at Mataram Middle School, which showed that the use of AI such as ChatGPT helps teachers develop interactive learning modules, significantly enhancing students' learning experiences. Additionally, research by Ibnu Ikhsan et al. found that 87.40% of middle school (2025) students use AI for math and Indonesian language tasks, which accelerates access to information and improves learning outcomes.hasil belajar.

In Vocational High Schools (SMK), AI plays a role in supporting vocational learning that is relevant to the needs of Industry 4.0. Jagad Muhammad et al. (2025) reported that the use of ChatGPT in SMK not only improves academic efficiency but also encourages students' digital literacy, although supervision is needed to maintain creativity and academic integrity. Ahmad Taufik et al.'s (2025) research at SMK Media Informatika Dasana Indah Tangerang also shows that AI training strengthens students' understanding of digital literacy and creativity, with a high level of enthusiasm for technology-based learning. Similarly, research by Mohammad Yahya et al. At (2023) SMK Negeri 5 Kota Malang found that the implementation of AI in training increases students' job readiness by up to 47.44%. This is consistent with the global perspective expressed by Selwyn et al. (2023), that AI can accelerate learning through interactive simulations and real-time feedback that support mastery of technical skills.eterampilan teknis.

At the higher education level, the implementation of AI is more directed toward personalized and collaborative learning. Yohanes Bowo Widodo et al. (2024) at Mohammad Husni Thamrin University reported that the use of AI can enhance student engagement and accelerate the learning process through adaptive feedback. Meanwhile, Praharisti Kurniasari et al. (2025) at Insan Budi Utomo University found that AI improves learning outcomes and active student participation, although there are risks of dependency that could reduce analytical skills. These findings align with UNESCO's (2021a) report, which states that AI plays an important role in supporting sustainable development in the education sector, particularly in big data analysis and collaborative research. Generally, the most prominent potential of AI is at the higher education and vocational school (SMK) levels, where infrastructure readiness and technological literacy are more developed compared to primary and secondary levels. However, at all levels, AI also contributes to strengthening Indonesian cultural values such as collaboration and mutual cooperation, as highlighted by Wulandari et al. (2020), who emphasize AI's role in shaping holistic education.tik. Nevertheless, the analysis also reveals various negative impacts and risks that need to be watched out for. The main risks include technology dependence, a decline in critical thinking skills, plagiarism, and digital infrastructure gaps between regions. Susanto et al. (2024) found that 61% of middle and high school students use ChatGPT or Gemini to complete assignments, which on one hand helps, but on the other hand increases tendencies toward dependence. Kurniahtunnis et

STKIP PGRI Situbondo @2023
DOI. https://doi.org/10.47668/jrrei.v1i1.2185

al. (2024) at RUSHD Outstanding High School reported that although 67% of students feel AI enhances critical thinking skills, 58% of them are worried about excessive dependence. At the university level, the risk of plagiarism becomes a major concern. Harmilawati et al. (2024) noted that although AI can strengthen critical thinking skills through personalized learning, ethical aspects such as plagiarism must be strictly regulated. secara ketat.

Additionally, other challenges include data privacy issues and algorithm bias, especially at the elementary level. Seituni and Akbari (2021) emphasize that the effectiveness of technology-based learning is highly influenced by the readiness of infrastructure and the digital competence of educators. Without strengthening the foundation of digital learning, the integration of AI could potentially widen educational disparities across regions in Indonesia. Nelvia Susmita et al. (2024) found that high school students are optimistic about the use of AI, but there is significant concern about personal data privacy. This is consistent with findings by Selwyn et al. (2023), who warn of algorithm bias originating from Western data, which could lead to inaccuracies in the local Indonesian context. Infrastructure limitations also worsen the situation Mitra Rahayu et al. (2025) show that although AI increases motivation among students with disabilities in Merauke, the lack of digital facilities remains a major obstacle.

Comparison with international literature shows that this risk pattern is consistent globally. Kasneci et al. (2023) found that about 40% of students abroad use AI for plagiarism, which impacts their analytical skills. However, the Indonesian context faces additional challenges such as uneven internet access in rural areas. Therefore, the implementation of AI must be adapted to Indonesia's social and technological conditions to ensure inclusive and sustainable results.

From a policy perspective, strategic steps such as training teachers and lecturers in digital literacy and AI usage ethics are necessary. Government investment in equitable digital infrastructure and AI ethics education for students and university students is also important to reduce the risk of misuse. Universities also need to establish clear regulations regarding plagiarism and the use of AI in academic writing.m penulisan akademik.

Overall, the research results indicate that AI has great potential as a catalyst for the modernization of Indonesian education, provided that its implementation is accompanied by infrastructure readiness, technological literacy, and strong ethical regulations. A local and collaborative approach is key to ensuring that AI integration not only enhances the effectiveness of learning but also supports the values of inclusivity and sustainability in Indonesian education.

CONCLUSION

This study systematically examined the potential and impact of Artificial Intelligence (AI) implementation in Indonesian education through a Systematic Literature Review (SLR) based on PRISMA guidelines, analyzing sixteen scholarly articles published between 2020 and 2025. The review encompassed all educational levels, from elementary schools to universities, emphasizing Indonesia’s unique context characterized by varying levels of digital literacy, infrastructure readiness, and socio-cultural diversity.

The findings indicate that AI holds significant potential to transform the Indonesian education system into one that is more adaptive, efficient, and inclusive. At the primary and secondary education levels, AI contributes to enhancing students’ motivation, engagement, and understanding of subjects such as mathematics and language. In vocational education (SMK), AI plays a crucial role in developing digital literacy, technical skills, and employability relevant to the Industry 4.0 era, especially through simulation-based and project-based learning. Meanwhile, at the higher education level, AI supports personalized and collaborative learning, accelerates

STKIP PGRI Situbondo @2023
DOI. https://doi.org/10.47668/jrrei.v1i1.2185

research processes, and enables large-scale data analysis, fostering innovation and sustainable academic growth. Collectively, these potentials demonstrate AI's role in not only improving educational quality but also nurturing 21st-century competencies, including critical thinking, creativity, and problem-solving. However, the study also identifies several negative impacts and challenges associated with AI implementation. These include technological dependency, which may diminish analytical and critical thinking abilities; academic plagiarism, especially in higher education; algorithmic bias arising from Western-based data models that may misrepresent local contexts; and data privacy concerns affecting younger learners. Moreover, digital infrastructure disparities between urban and rural regions remain a major obstacle to equitable access to AI-powered education. Without adequate readiness in infrastructure and digital literacy, the integration of AI risks widening the educational gap rather than closing it.

From a policy perspective, these findings underscore the need for a comprehensive national strategy to ensure the ethical and sustainable adoption of AI in education. Priority actions include: (1) strengthening digital infrastructure across regions, (2) providing professional training for educators on AI literacy and ethical use, (3) establishing regulatory frameworks addressing data security, plagiarism, and algorithmic fairness, and (4) promoting collaboration among government, educational institutions, and technology industries to develop AI systems aligned with Indonesia's cultural and educational context.In conclusion, the implementation of Artificial Intelligence presents a transformative opportunity for Indonesian education, capable of modernizing teaching and learning processes while fostering inclusivity and sustainability. Nevertheless, its success depends on ethical governance, digital preparedness, and contextual adaptation. When integrated responsibly, AI can serve as a catalyst for national educational reform, enhancing learning outcomes and promoting equitable access to quality education that reflects Indonesia's cultural values and long-term developmental goals.

REFERENCES

Akbari, R., & Seituni, S. (2021). *Edusaintek : Jurnal Pendidikan , Sains dan Teknologi ANALISIS EFEKTIFITAS PEMBELAJARAN DARING BERBASIS WEBSITE (STUDI KASUS SISWA KELAS X AKUNTANSI LEMBAGA DI SMKN 2 SITUBONDO MATA PELAJARAN SIMULASI DIGITAL) STKIP PGRI Situbondo , Indonesia Edusaintek*. *8*(1), 11–20.

Harmilawati, S., & Putri, R. (2024). Etika Penggunaan AI dalam Pendidikan Tinggi: Studi di Universitas Islam Ahmad Dahlan. *Jurnal Etika Dan Teknologi*, *4*(1), 40–55.

Ikhsan, I., & Sari, M. (2025). Pemanfaatan AI untuk Pembelajaran Matematika dan Bahasa Indonesia di SMP. *Jurnal Inovasi Pendidikan*, *15*(3), 33–48.

Kasneci, E., & others. (2023a). AI and Academic Integrity in Higher Education. *Computers in Human Behavior*, *140*, 107–120.

Kasneci, E., & others. (2023b). The role of artificial intelligence in education: Opportunities and challenges. *Computers \& Education*, *185*, 104694.

Kasneci, E., Sesmero, M., & Holmes, W. (2023). Risks of AI Use in Higher Education: Global Survey Analysis. *AI and Society*, *38*(5), 1293–1308.

Kurniahtunnis, L., & Adi, P. (2024). Persepsi Siswa terhadap Penggunaan AI untuk Penulisan Esai di SMA Unggulan RUSHD. *Jurnal Evaluasi Pembelajaran*, *10*(2), 115–129.

Kurniasari, P., Utomo, B., & Anjani, D. (2025). Integrasi AI dalam Pembelajaran Kolaboratif Mahasiswa di Universitas Insan Budi Utomo. *Jurnal Inovasi Pendidikan Tinggi*, *7*(2), 70–84.

Lukman, A., & others. (2023). Implementasi AI dalam Pendidikan Indonesia: Tantangan Infrastruktur. *Jurnal Teknologi Pendidikan*.

STKIP PGRI Situbondo @2023
DOI. https://doi.org/10.47668/jrrei.v1i1.2185

Muhammad, J., Farhan, A., & Wibowo, R. (2025). ChatGPT sebagai Media Pembelajaran Vokasi pada Siswa SMK: Peluang dan Tantangan. *Jurnal Pendidikan Vokasional Indonesia*, *11*(1), 27–41.

Muhammad, J., Siti Seituni, & Yuliana, D. (2025). *Edusaintek : Jurnal Pendidikan , Sains dan Teknologi PKL SISWA STKIP PGRI Situbondo , Indonesia * Corresponding author : sitiseituni@gmail.com PENDAHULUAN Di era digital yang sangat canggih saat ini perkembangan teknologi semakin pesat begitu juga dengan*. *12*(3), 1789–1801.

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., … Moher, D. (2021). The PRISMA 2020 Statement: An Updated Guideline for Reporting Systematic Reviews. *BMJ*, n71. https://doi.org/10.1136/bmj.n71

Polanin, J. R., Pigott, T. D., Espelage, D. L., & Grotpeter, J. K. (2019). Best Practice Guidelines for Abstract Screening Large-Evidence Systematic Reviews and Meta-Analyses. *Research Synthesis Methods*, *10*(3), 330–342. https://doi.org/10.1002/jrsm.1354

Pratama, E. B., Hendini, A., & Hidayat, W. F. (2023). *MENGGALI POTENSI BELAJAR MENGAJAR DENGAN TEKNOLOGI AI (ARTIFICIAL INTELLIGENCE)*. *7*(6), 3530–3534.

Rahayu, M., & Oktaviani, D. (2025). Pemanfaatan AI untuk Meningkatkan Motivasi Belajar Siswa Disabilitas di SLB Negeri Anim Ha Merauke. *Jurnal Pendidikan Inklusif*, *9*(1), 25–39.

Rahman, F., & others. (2022). AI tools for personalized learning in elementary schools: An Indonesian perspective. *Education Technology Research*, *10*(3), 78–92.

Sabbah, K., Mahamid, F., & Mousa, A. (2023). Augmented Reality-Based Learning: The Efficacy on Learner's Motivation and Reflective Thinking. *International Journal of Information and Education Technology*, *13*(7), 1051–1061. https://doi.org/10.18178/ijiet.2023.13.7.1904

Seituni, M., & Akbari, F. (2021). Digital Readiness and Technological Infrastructure in AI-Based Learning. *International Journal of Education Technology*, *19*(3), 200–215.

Selwyn, N., Kasneci, E., & Holmes, W. (2023). Artificial Intelligence and Education: Global Potentials and Risks. *Computers and Education Review*, *2*, 100041. https://doi.org/10.1016/j.cae.2023.100041

Selwyn, N., & others. (2023). AI in Education: Opportunities and Challenges. *Learning, Media and Technology*, *48*(1), 1–20.

Selwyn, N., Smith, K., Pangrazio, L., & Lem, D. (2023). AI in Education: What Works and What Doesn't. *Journal of Computer Assisted Learning*, *39*(1), 1–15. https://doi.org/10.1111/jcal.12761

Sholihatin, E., & others. (2023). Vocational training with AI simulations in Indonesian SMK: Efficiency and outcomes. *Journal of Vocational Education*, *14*(2), 55–70.

Simamora, R. (2024). Systematic Literature Review Using PRISMA. *Research Methods in Education*, *25*(4), 301–315.

Sujana, I. M., Rahmawati, L., & Putra, D. (2023). Integrasi ChatGPT dalam Pengembangan Modul Pembelajaran Inovatif di SMP Mataram. *Jurnal Teknologi Pendidikan*, *8*(2), 101–115.

Susanto, A., Rahman, Y., & Fitriani, E. (2024). Analisis Ketergantungan Siswa SMP/SMA terhadap ChatGPT dan Gemini dalam Proses Belajar. *Jurnal Psikologi Pendidikan*, *18*(1), 22–35.

Susmita, N., & Arifin, R. (2024). Persepsi Siswa terhadap Risiko Privasi Data dalam Penggunaan AI di SMA Negeri 2 Sungai Penuh. *Jurnal Kebijakan Pendidikan*, *12*(1), 60–72.

STKIP PGRI Situbondo @2023
DOI. https://doi.org/10.47668/jrrei.v1i1.2185

Sutrisno, H., & others. (2021). Infrastructure Challenges in Rural Education. *Journal of Rural Education*, *12*(3), 78–92.

Taufik, A., Rini, S., & Rahmad, T. (2025). Pelatihan AI untuk Meningkatkan Literasi Digital dan Kreativitas di SMK Media Informatika Dasana Indah Tangerang. *Jurnal Literasi Digital*, *9*(2), 60–73.

Thomas, A. (2025). Penerapan AI dalam Pembelajaran SMA Gracia: Analisis Motivasi dan Kinerja Siswa. *Jurnal Pendidikan Digital*, *12*(1), 45–58.

UNESCO. (2021a). *AI and Education: Guidance for Policy Makers*. UNESCO Publishing.

UNESCO. (2021b). *Artificial Intelligence and Education: Guidance for Policy-Makers*.

Widodo, A., & others. (2024). Personalization in high school education using AI: A study from Indonesia. *Computers in Human Behavior*, *150*, 107345.

Widodo, Y. B., Hapsari, A., & Sutanto, D. (2024). AI-Based Personalized Learning in Higher Education: A Case Study from Universitas Mohammad Husni Thamrin. *Jurnal Teknologi Dan Pembelajaran*, *13*(1), 55–69.

Widodo, Y. B., Sibuea, S., & Narji, M. (2024). *Kecerdasan Buatan dalam Pendidikan : Meningkatkan Pembelajaran Personalisasi*. *10*(2), 602–615.

Wulandari, N., & Prasetyo, T. (2020). Pendidikan Holistik Berbasis Kecerdasan Buatan: Konteks Budaya Indonesia. *Jurnal Filsafat Dan Pendidikan*, *5*(3), 99–112.

Wulandari, S., & others. (2020). Nilai Budaya dalam Implementasi AI di Pendidikan. *Jurnal Pendidikan Budaya*.

Yahya, M., Hidayat, F., & Ananda, R. (2023). AI Training Program to Improve Vocational Students' Work Readiness: Case Study at SMKN 5 Malang. *Indonesian Journal of Educational Technology*, *6*(4), 89–104.

Yusuf, M., & others. (2025). Risiko Plagiarisme dan Ketergantungan AI dalam Pendidikan. *Jurnal Etika Pendidikan*.