ANALYSIS OF THE EFFECTIVENESS OF USING ARTIFICIAL INTELLIGENCE IN LANGUAGE LEARNING

M Afiv Toni Suhendra Saragih[1*], Mandra Saragih[2]

[*1, 2]Universitas Muhammadiyah Sumatera Utara
[*1]email:m.avivtonisuhendra@umsu.ac.id
[2]email:mandrasaragih@umsu.ac.id

Abstract: This research examines how the integration of Artificial Intelligence (AI) affects Indonesian language instruction. The research employs a qualitative descriptive methodology to understand AI's role in teaching and learning Indonesian. Research materials were gathered from academic publications, scholarly journals, and digital media reports. The methodology involved comprehensive analysis and documentation of information from these diverse sources related to the study's focus. After systematic organization and analysis within a theoretical structure, the research reveals that incorporating AI into Indonesian language teaching shows promise for enhancing learning outcomes and instructional efficiency. While certain drawbacks exist in utilizing AI for educational purposes, the technology holds significant potential as an educational resource for Indonesian language instruction when properly implemented and integrated into pedagogical frameworks.

Keywords: Artificial Intelligence, Effectiveness, Language Learning

Introduction

In this era of rapid digital development, technology has entered various aspects of life, including education and daily life. One very important advancement is the emergence of Artificial Intelligence (AI) according to (Rahmat et al., 2022). AI, as a modeling of human intelligence applied to a machine, has become an integral part of the Industrial Revolution 4.0 (Rifky, 2024). The development of artificial intelligence has brought many benefits in various fields, including education (Ramadhani at al., 2021 & Luh Putu Ary Sri Tjahyanti, 2022). This phenomenon has a very important impact because AI has the ability to completely change the teaching methods of teachers and the way students gain knowledge (Muthmainnah et al., 2024a). The inclusion and development of AI in the curriculum and education system creates very significant progress, providing educators and academic institutions with innovative AI-based devices and applications (Zhang et al., 2024). Technology can help teachers understand the learning needs of each student and provide teaching that suits those needs. For example, smart technology can help teachers understand data about students, create a better learning environment, increase student participation, and achieve teaching goals (Al-Ghonmein & Al-Moghrabi, 2024).

The rapidly evolving digital era has transformed how humans interact, transcending geographical boundaries and reshaping old paradigms. Education is one of the areas most impacted by this digital transformation (Syanurdin, 2020). Particularly, Indonesian language education plays a crucial role in shaping linguistic character and values within an increasingly digitally integrated society (Destari et al., 2023). However, individuals have the freedom to view technology as either a positive benefit or a negative impact (Alfitriana Purba, 2023). Therefore, the management of technology in the context of Indonesian language education requires deep understanding to ensure effective and efficient technology-enhanced education that aligns with

the demands of the current digital era (Tchanturia & Dalakishvili, 2023). The accelerating technological development must be leveraged optimally to achieve more effective and sustainable educational goals.

Recent research on AI in education highlights its growing impact and potential. AI technologies are being applied in various educational contexts, including administration, instruction, and learning (Al-Khowarizmi, 2023 & Chen et al., 2020). These applications range from intelligent tutoring systems to personalized learning experiences and adaptive testing (Rizvi, 2023). AI chatbots, in particular, are being explored for their potential to enhance educational interactions and support various tasks (Jain et al., 2024). While AI offers numerous benefits, such as improved student engagement and addressing inequality issues, challenges remain, including ethical concerns and the need for effective integration into existing educational systems (Rizvi, 2023). The adoption of AI in education is more advanced in developed countries, with research becoming particularly prominent in the Industry 4.0 era (Tahiru, 2021). As AI continues to evolve, ongoing research is needed to address challenges, explore new applications, and ensure its responsible implementation in educational settings (Jain et al., 2024).

This study focuses on the influence of AI in Indonesian language education. While research on the positive and negative impacts of AI in Indonesian language education is still relatively rare, the Merdeka Belajar era demands that teachers master innovative technologies. As such, teachers can leverage various technologies to support their teaching and learning processes (Rebolledo Font de la Vall & González Araya, 2023). For instance, AI can help teachers design more effective Indonesian language lessons (Buddha et al., 2024). The recent popularity of AI technology, such as ChatGPT, allows it to provide answers to all questions asked. However, alongside the convenience offered by AI, there are also other problems. Excessive reliance on AI can make students lazy to learn, as they become accustomed to receiving instant answers without going through the thinking process.

Literature Review

Artificial Intelligence

AI has the potential to transform various industries, including education, by automating tasks, personalizing learning, and enhancing decision-making (Popenici & Kerr, 2017). The rapid advancements in AI technology have led to its increasing adoption in educational settings, with the promise of improving learning outcomes and teaching efficiency (Renz & Hilbig, 2020).

Effectiveness of Using Artificial Intelligence

Studies have shown that the integration of AI in education can improve student engagement, personalize learning experiences, and provide real-time feedback (Zawacki-Richter et al., 2019). AI-powered systems can analyze student data to identify learning patterns, provide customized content, and predict academic performance, leading to more effective teaching and learning (Blikstein & Worsley, 2016).

Artificial Intelligence in Language Learning:

AI-powered language learning applications can provide interactive, personalized, and adaptive learning experiences, which can enhance language acquisition and proficiency (Golonka et al., 2014). Chatbots and virtual assistants powered by AI can engage learners in conversational practice, offer feedback, and adapt to individual needs, supporting language learning (Haristiani, 2019). The use of AI in language learning can also facilitate the development of intelligent tutoring systems, automated writing evaluation, and speech recognition for language practice (Xu et al., 2019).

Method

This article discusses the impact of using Artificial Intelligence (AI) in Indonesian language learning. The research method used in this article is a scientific method with a qualitative approach, designed to collect data for specific purposes and uses (Sugiyono, 2019). The primary data sources in this research include relevant literature, scientific journals, and online news. The data collection process involved accessing, reading, evaluating, and recording various materials found in these sources. The collected data was then filtered and integrated into a theoretical framework to form the basis of the research argument and conclusions. The aim of this approach is to provide a comprehensive understanding of the impact of AI implementation in the context of Indonesian language learning. Thus, this research provides deep insights into how AI can influence and enhance the Indonesian language learning process.

Result and Discussion

The Effectiveness of AI in Enhancing Student Learning Capabilities

The use of AI technology in Indonesian language learning has brought significant impacts on student comprehension and participation. AI enables the implementation of interactive learning applications, such as digital exercises and educational games, designed to adapt learning experiences to students' individual learning styles. According to Adlawan (2023), AI helps create more engaging and interactive learning methods, which encourage students to be more actively involved in the learning process. For example, chatbots used for conversation practice in Indonesian language provide instant feedback and allow students to practice speaking in realistic contexts, which significantly increases their engagement (Suh et al., 2022). With the adaptive and personalization features offered by AI, students can learn with materials that suit their needs and learning styles, which positively impacts their understanding.

AI also plays a role in customizing learning materials, enabling more effective adjustments according to individual student needs and abilities (Afrita, 2023). AI algorithms analyze data from online activities, test answers, and previous performance to create accurate learning profiles for each student (Muthmainnah et al., 2024b). Research shows that this personalization can improve student learning outcomes in Indonesian language. For instance, the use of AI-based voice assistants allows students to search for references and materials that match their needs, as well as providing exercises relevant to their comprehension level (Chen et al., 2024). This customization enhances students' understanding and overall learning outcomes by ensuring that the presented materials align with each student's abilities.

Furthermore, AI supports teaching efficiency by reducing teachers' administrative burden, allowing them to focus on deeper teaching interactions (Syarafudin & Ikawati, 2020). AI can manage learning materials and provide quick and objective feedback, which reduces teachers' administrative workload (Haristiani, 2019). Research shows that the use of AI-based data analysis tools in Indonesian language classes helps teachers adjust teaching strategies based on real-time student performance, making the learning process more efficient (Li & Liang, 2019). By utilizing AI for administrative tasks and assessment, teachers can focus more on teaching aspects and student interaction.

The use of AI in Indonesian language learning also has the potential to influence the development of students' critical thinking skills. AI-based learning tools, such as word games and chatbot-based exercises, encourage students to think creatively and independently. Through interactive games involving new vocabulary and word usage contexts, students can develop their critical thinking abilities (Mageira et al., 2022). However, there is a risk that excessive dependence on AI technology may reduce students' ability to think critically and independently.

Research shows that while AI can help in finding answers, it is important to balance its use with activities that actively promote critical thinking (Syanurdin, 2020).

However, the use of AI also faces several obstacles and challenges. One of the main challenges is the risk of students' dependency on technology, which can reduce their active engagement in learning. Additionally, the digital divide between students who have access to advanced technology and those who do not can exacerbate educational inequalities. Recent studies highlight the importance of ensuring equal access to technology and developing strategies to address AI dependency, so that this technology remains effective and beneficial (Dianne Adlawan, 2023). Addressing these challenges requires a prudent approach to utilizing AI in ways that support and enhance students' learning experiences without sacrificing their active engagement.

Benefits of AI Use for Students and Teachers in Indonesian Language Learning

The use of AI in Indonesian language learning offers several significant benefits for both students and teachers. One of its main advantages is AI's ability to create personal and adaptive learning experiences. AI can analyze student learning data to identify their weaknesses and strengths, enabling teachers to adjust their teaching strategies more effectively. For example, research conducted by (Ibnu Fitrianto, 2024) shows that the use of AI in language learning can increase student engagement, motivation, and learning outcomes through a more adaptive and inclusive curriculum approach.

Furthermore, AI can improve efficiency in managing administrative and teaching tasks. With the automation of routine tasks such as assessment and reporting, teachers can focus more on important pedagogical aspects, such as direct interaction with students and the development of in-depth teaching strategies. A study by (Ibrahim bin Salem, 2024) reveals that the use of AI tools for data-based learning analysis provides real-time feedback to teachers, allowing them to adjust teaching methods based on student performance in real-time, thus improving teaching efficiency and effectiveness.

AI also plays a role in developing students' critical thinking skills and creativity. AI technologies such as chatbots and interactive learning platforms encourage students to think more critically and independently in solving problems or completing specific tasks. According to (Mageira et al., 2022), the use of AI-based learning tools, such as word games and interactive exercises, can encourage students to think more creatively and develop their problem-solving skills, which are crucial in the Indonesian language learning process.

AI provides broader and faster access to various learning resources and references. This technology can identify learning materials that match students' needs and learning styles, which in turn can increase their interest and engagement in the learning process. A study by Adlawan (2023) confirms that AI facilitates the enrichment of learning materials through content customization that aligns with students' learning preferences, thereby enhancing their understanding of the taught material.

However, behind these benefits, there are challenges in using AI in education, such as the risk of excessive dependence on technology and the digital divide. These challenges can reduce students' active involvement and create inequalities in educational access. Therefore, it is crucial for educators and policymakers to develop wise and inclusive strategies in integrating AI into the learning system to optimize the benefits of this technology without sacrificing students' critical thinking abilities and independence.

Thus, the integration of AI in Indonesian language learning can offer various significant potential benefits, but requires a careful implementation approach to optimize learning outcomes and address challenges that may arise (Shuai Xu, 2023).

Conclusion

The use of AI in Indonesian language learning for students and teachers demonstrates that AI has great potential to improve the quality of learning. AI can help personalize learning, provide faster and more accurate feedback, and enrich teaching methods. For teachers, AI can serve as a supporting tool in designing more effective and efficient materials. However, the implementation of AI also requires infrastructure readiness and improved digital literacy among teachers and students to be utilized optimally.

The use of AI also opens opportunities for developing more adaptive and personal teaching methods, but this needs to be balanced with teacher training and investment in technological infrastructure. This research also highlights the importance of educational policies that support the use of AI, as well as the need for continuous evaluation to ensure positive impacts on student learning outcomes.

References

Afrita, J. (2023). Peran Artificial Intelligence dalam Meningkatkan Efisiensi dan Efektifitas Sistem Pendidikan. COMSERVA: Jurnal Penelitian Dan Pengabdian Masyarakat, 2(12), 3181–3187. https://doi.org/10.59141/comserva.v2i12.731

Alfitriana Purba, A. S. (2023). Peran Teknologi dalam Transformasi Pendidikan Bahasa Indonesia di Era Digital. AFoSJ-LAS, 3(3), 43. https://jlas.lemkomindo.org/index.php/AFoSJ-LAS/index

Al-Ghonmein, A. M., & Al-Moghrabi, K. G. (2024). The potential of ChatGPT technology in education: advantages, obstacles and future growth. IAES International Journal of Artificial Intelligence (IJ-AI), 13(2), 1206. https://doi.org/10.11591/ijai.v13.i2.pp1206-1213

Al-Khowarizmi, S., & Lubis, A. R. (2023). *Artificial Intelligence*. umsu press.

Blikstein, P., & Worsley, M. (2016). Multimodal learning analytics and education data mining: using computational technologies to measure complex learning tasks. *Journal of Learning Analytics*, 3(2), 220-238.

Buddha, H., Shuib, L., Idris, N., & Eke, C. I. (2024). Technology-Assisted Language Learning Systems: A Systematic Literature Review. IEEE Access, 12, 33449–33472. https://doi.org/10.1109/ACCESS.2024.3366663

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

Destari, D., Tadris, P., Inggris, B., Pendidikan Bahasa, J., Tarbiyah, F., Keguruan, I., Islam, U., Sultan, N., & Idris, A. M. (2023). Pendidikan Global di Era Digital: Transformasi dalam Skala Internasional Article Info ABSTRAK. In Jurnal Pendidikan West Science (Vol. 01, Issue 08).

Golonka, E. M., Bowles, A. R., Frank, V. M., Richardson, D. L., & Freynik, S. (2014). Technologies for foreign language learning: a review of technology types and their effectiveness. *Computer Assisted Language Learning*, 27(1), 70-105.

Haristiani, N. (2019). Artificial Intelligence (AI) Chatbot as Language Learning Medium: An inquiry. Journal of Physics: Conference Series, 1387(1). https://doi.org/10.1088/1742-6596/1387/1/012020

Ibnu Fitrianto, C. E. S. M. S. (2024). Utilizing Artificial Intelligence for Personalized Arabic Language Learning Plans. International Journal of Post Axial: Futuristic Teaching and Learning.

Ibrahim bin Salem. (2024). Integrating Artificial Intelligence in Personalized Learning: A Future-Oriented Approach to Enhance Student Engagement and Achievement. International Journal of Post Axial: Futuristic Teaching and Learning.

Jain, V., Singh, I., Syed, M., Mondal, S., & Ranjan Palai, D. (2024). Enhancing Educational Interactions: A Comprehensive Review of AI Chatbots in Learning Environments. *2024 11th International Conference on Reliability, Infocom Technologies and Optimization (Trends and Future Directions) (ICRITO)*, 1-5.

Luh Putu Ary Sri Tjahyanti, P. S. S. , M. S. G. (2022). PERAN ARTIFICIAL INTELLIGENCE (AI) UNTUK MENDUKUNG PEMBELAJARAN DI MASA PANDEMI COVID-19. Jurnal Komputer Dan Teknologi Sains (KOMTEKS).

Mageira, K., Pittou, D., Papasalouros, A., Kotis, K., Zangogianni, P., & Daradoumis, A. (2022). Educational AI Chatbots for Content and Language Integrated Learning. Applied Sciences (Switzerland), 12(7). https://doi.org/10.3390/app12073239

Muthmainnah, N., Rahmayanti, V. A., & Faizin, Moh. (2024). Modernitas Alat Pendidikan Dalam Perspektif Artificial Intelligence Fenomena Kemajuan Zaman Pendidik Abad 21. Pedagogi: Jurnal Ilmu Pendidikan, 24(1), 46–55. https://doi.org/10.24036/pedagogi.v24i1.1937

Popenici, S. A., & Kerr, S. (2017). Exploring the impact of artificial intelligence on teaching and learning in higher education. *Research and Practice in Technology Enhanced Learning*, 12(1), 1-13.

Rahmat, R. F., Pratama, M. F., Purnamawati, S., Faza, S., Lubis, A. R., Al-Khowarizmi, A. K., & Lubis, M. (2022). Astrocytoma, ependymoma, and oligodendroglioma classification with deep convolutional neural network. *IAES International Journal of Artificial Intelligence*, *11*(4), 1306.

Ramadhani, F., Al-Khowarizmi, A., & Sari, I. P. (2021). Implementasi Metode Topsis Dalam Menangani Masalah Pengalokasian Dosen Pembimbing Skripsi Dilingkungan Fakultas Ilmu Komputer Dan Teknologi Informasi Universitas Muhammadiyah Sumatera Utara. *InfoTekJar: Jurnal Nasional Informatika dan Teknologi Jaringan*, *6*(1), 104-110.

Rebolledo Font de la Vall, R., & González Araya, F. (2023). Exploring the Benefits and Challenges of AI-Language Learning Tools. International Journal of Social Sciences and Humanities Invention, 10(01), 7569–7576. https://doi.org/10.18535/ijsshi/v10i01.02

Renz, A., & Hilbig, R. (2020). Prerequisites for artificial intelligence in further education: identification of drivers, barriers, and business models of educational technology companies. *International Journal of Educational Technology in Higher Education*, 17(1), 1-21.

Rifky, S. (2024). Indonesian Journal of Multidisciplinary on Social and Technology Homepage Dampak Penggunaan Artificial Intelligence https://doi.org/10.31004/ijmst.v2i1.287 Bagi Pendidikan Tinggi. 2(1), 37–42.

Rizvi, M. (2023). Exploring the landscape of artificial intelligence in education: Challenges and opportunities. *2023 5th International Congress on Human-Computer Interaction, Optimization and Robotic Applications (HORA)*, 01-03.

Shuai Xu, T. W. J. D. D. W. (2023). Retracted: Design and Implementation of Intelligent Teaching System Based on Artificial Intelligence and Computer Technology. Security and Communication Networks, 2023, 1–1. https://doi.org/10.1155/2023/9854971

Sugiyono, P. D. (2019). metode penelitian pendidikan (kuantitatif, kualitatif, kombinasi, R&D dan penelitian pendidikan). Metode Penelitian Pendidikan, 67.

Syanurdin. (2020). Prosiding Seminar Daring Nasional: Pengembangan Kurikulum Merdeka Belajar Program Studi Pendidikan Bahasa Indonesia. https://ejournal.unib.ac.id/index.php/semiba/issue/view/956/Tersediadi:https://ejou rnal.unib.ac.id/index.php/semiba/issue/view/956/

Syarafudin, H., & Diah Ikawati, H. (2020). Faktor-Faktor yang Mempengaruhi Profesionalisme Guru. 1(2), 47–51.

Tahiru, F. (2021). AI in Education: A Systematic Literature Review. *J. Cases Inf. Technol.*, *23*, 1-20.

Tchanturia, N., & Dalakishvili, R. (2023). The Impact of Artificial Intelligence on E-Commerce Success. Academics and Science Reviews Materials, 5. in

Xu, Y., Liu, J., Gong, Z., Huang, Y., & Qin, J. (2019). Application of artificial intelligence in English teaching and learning. *In Proceedings of the 4th International Conference on Humanities Science, Management and Education Technology* (pp. 267-271).

Zawacki-Richter, O., Marín, V. I., Bond, M., & Gouverneur, F. (2019). Systematic review of research on artificial intelligence applications in higher education–where are the educators?. *International Journal of Educational Technology in Higher Education*, 16(1), 1-27.

Zhang, Y., Ruan, H., Fan, Z., & Roychoudhury, A. (2024). AutoCodeRover: Autonomous Program Improvement. http://arxiv.org/abs/2404.05427