Elementary School Teachers' Perspectives on Utilizing Artificial Intelligence for Developing Learning Media

Reza Rachmadtullah,[1]*, Mareyke Jessy Tanod[2], Rasmitadila[3],

Nico Irawan[4], Alan McNeilly[5], Suharni[6]

[1] Universitas PGRI Adi Buana Surabaya, Indonesia,
[2] STKIP PGRI Bandar Lampung, Indonesia
[3] Universitas Djuanda Bogor, Indonesia
[4] Stamford International University, Thailand
[5] University of Bolton, United Kingdom
[6] Universiti Kebangsaan Malaysia, Malaysia

*Correspondence author: reza@unipasby.ac.id

Abstract

The rapid advancement of Artificial Intelligence (AI) technology has brought about significant changes in education, particularly in elementary school settings. Integrating AI programs has led to substantial modifications, offering valuable support to educators in developing learning media. This study employed qualitative research to investigate elementary school teachers' viewpoints on utilizing AI for developing learning media, its integration into teaching activities, and the specific AI types utilized. The findings emphasized the crucial role of AI in education, highlighting the importance of careful AI deployment aligned with specific instructional needs and educational goals. Educators appreciated the significant assistance provided by AI in accessing a wide range of information and reference materials essential for creating engaging learning content. Additionally, participants noted the customized nature of their AI usage, tailored to their teaching requirements and desired educational outcomes. The research emphasized teachers' reliance on AI for information access and content development and underscored its vital role in creating a safe and enriching educational environment for educators and students.

Keywords: Teachers' Perspectives, Artificial Intelligence, Learning Media

INTRODUCTION

The current industrial revolution 4.0 has brought rapid technological progress and innovation, such as augmented reality technology, virtual reality, the internet of things, and artificial intelligence, with technological developments in the era of revolution 4.0 having changed aspects of human life, namely coexistence. Besides that, technology also changes our perceptions of the world of economics, social, health, legal, information technology, and engineering; even education fields are not immune to current technological advances. In this context, 'Education 4.0' refers to a paradigm shift in education that leverages advanced technologies to enhance learning outcomes and prepare students for the challenges of the 21st century (de Souza & Debs, 2024). (de Souza, & Debs, 2024).

In education, there is a relationship between the industrial revolution and the needs of the 21st century, namely that students are currently equipped with cognitive skills and knowledge that can provide innovation and problem-solving abilities (RodríguezAbitia et al., 2020). Technology-based educational interventions also have an essential role in achieving the goals of Education 4.0 because they involve designing, developing, and implementing products, services, and processes by applying scientific knowledge to meet needs, find new solutions, or add value. Students can be introduced to cutting-edge technology and digital tools through this intervention, which can be utilized to improve student learning outcomes, foster collaboration and creativity, and increase the quality of the learning process (Zhou et al., 2020).

The increasing role of AI in education brings opportunities and challenges for today's educators. By implementing this technology proactively, teachers can utilize AI to improve the quality of teaching and make AI an interactive learning medium that encourages students' cognitive understanding, which can improve student learning outcomes and promote equality in the classroom. This is why AI tools must remain included in teacher strategies to create a conducive and enjoyable learning atmosphere for students (Apriadi & Sihotang, 2023). Using AI applications in classroom learning activities can increase students' self-confidence and be fun for students because they interact directly with technological applications. Students can look for answers they did not know, but in its implementation, the teacher still has to accompany AI (Saputra et al. (2023).

Furthermore, learning activities in the classroom using AI can also improve learning through gamification, which can make learning fun (Zahara et al., 2021). Implementing AI tools can assist educators in utilizing more interactive teaching techniques to meet learning objectives and enhance student success. Although it cannot be denied that artificial intelligence is now becoming part of our lives, this technology still has several advantages and disadvantages that need attention and

need to be discussed. Through research studies, it can provide input and more comprehensive benefits (Adiawan, 2023).

AI technology, much like any tool or medium, has the potential to bring both benefits and harm. Currently, a significant issue is the misuse of AI, leading to negative impacts, including (1) Overreliance on AI among students can foster laziness, hinder critical thinking, and potentially lower literacy levels. (2) Improper use of AI poses a risk of plagiarism, especially when utilizing AI-based essay writing systems like GPT Chat. It is essential for students to avoid submitting unoriginal work and instead use GPT Chat as a reference, properly paraphrasing and crediting the source (Dehouche, 2021). Moreover, the adverse effects of using AI include: (1) potentially leading to decreased motivation and effort from both teachers and students, (2) reducing the workload of educators, particularly in administrative tasks, (3) AI's inability to comprehend the context and intent of created information, and (4) AI's reliance on programmed instructions (Abidin, 2023).

On the other hand, some risks need to be considered. Some possible risks relate to cybercrime, artificial intelligence errors and inaccuracies, morality, and psychology. Technological developments, especially AI used in classroom learning activities, do not need to be rejected (Dewanto, 2023). This misuse of AI cannot be justified or even allowed. However, we cannot avoid the fact that the development of AI will make it easier for us to provide information on learning materials. Therefore, the role of teachers in the current technological era must be to be able to direct and guide students in using AI technology for positive purposes, such as finding complex materials to understand or looking for abstract examples to become real.

Apart from that, teachers can also direct and guide students in using AI by using the applications that have been provided, such as search engines and virtual assistants such as Siri, Google Assistant, and Cortana. AI development has reached a fantastic level in teaching and learning activities. In schools, using AI can help students control and monitor their learning, enabling them to live and work well and independently in the future (Alkhalifi et al., 2024). The use of AI as a learning medium and reference makes it easier for teachers and students because it can dig up information related to the material being taught and makes it easier to provide descriptions and examples of learning problems that have not been solved or are difficult for students to understand (Sperling et al., 2024; Rachmadtullah et al. (2023). Apart from that, artificial intelligence will lead to precision learning in the future. Current technology-based learning media are not only limited to e-books, videos, e-learning, etc. but also use newer technologies such as AI (Sabella et al., 2023; Amandha et al., 2023). This AI technology works with an automation process that will facilitate other processes in a system (Rachman et al., 2023; Amandha et al., 2023).

Research studies on the development of AI as a learning medium are being discussed worldwide because they have a positive impact. Research conducted by Xia et al. (2022) shows that one of the main results of the application of artificial intelligence is that it has a good influence because it can increase students' learning motivation. In the era of technological development, students currently enjoy using technology such as smartphones, computers, and others, so that students learning using AI provides positive encouragement to increase students' interest in learning (Lin & Chang, 2020) and further facilitates an interactive learning environment through special tools such as Smart Sparrow which increases student engagement with learning content (Karsenti, 2019).

Many studies have also shown the increase in learning achievement obtained by students by learning through AI technology (Khan et al., 2021; Kim et al., 2021). AI is proven to have a positive influence on student happiness in the implementation of teaching and learning in the classroom. The learning outcomes of students who use AI assistance are proven to increase. Students also know about technological advances (Winkler & Soellner, 2018). Utilizing AI in the classroom is proven to give the impression that learning and teaching require innovation and technological assistance. Currently, students are close to technology. Therefore, the teaching process in class also uses technology to motivate students (Clarizia et al., 2018).

Furthermore, one of the reasons behind increasing learning motivation with the help of AI is the development of student psychology, which also influences students' curiosity about technology. Currently, students are very close to smartphones; therefore, by using AI, students are directed to positive things (Cunningham-Nelson et al., 2019). Based on relevant research that has been carried out, we also conducted a qualitative study on how elementary school teachers perceive themselves in developing learning media using the help of artificial intelligence. This research study that we conducted is critical in finding out how teachers understand AI as a learning medium and how often teachers use AI as a learning medium. The benefits to be gained from this research are Academic Benefits. This research can be developed further, especially on AI-related topics in elementary schools. Practical Benefits: Implementing the results of this research so that it can be used for further research or literary studies.

AI technology can help make it easier for teachers to increase their teaching efficiency. Intelligent data analysis allows teachers to identify learning patterns and understand the needs of their students in class, and with AI, teachers can adjust teaching methods. This research can also contribute knowledge to teachers in Indonesia and even worldwide to continue innovating in classroom learning activities by utilizing AI. New ideas and thoughts will emerge to create an optimal learning climate.

METHODS

Research design

The method used in this research is descriptive qualitative. In this research, answers to research questions were obtained through observation, interviews, and documentation. The selection of qualitative descriptives is based on phenomena that respondents experience. This research produces descriptive data in written form about the people and behavior observed. In this research, efforts were made to collect descriptive data so that it could be presented in a word description format.

Respondent

The number of respondents in this research was three teachers. One teacher with the initials JW from an elementary school in Cirebon City, VI from an elementary school in East Jakarta, and WWA from an elementary school in Surabaya City. The research respondents were selected because they met the criteria of mastering technology and using AI as a source and learning medium.

Research Data Source

The research data is sourced from subject data obtained by the researcher. The study employed interview techniques, using an interview instrument with questions relevant to the research focus. In this research, primary data was collected through the verbal responses of participants and field observations related to the development of learning media with the assistance of AI.

Data Collection and Data Analysis

The researchers directly engaged with the participants to gather data. They employed observation sheets, documentation, and interviews as data collection methods. Following the data collection, they utilized three procedures to analyze it: data reduction, data presentation, and drawing conclusions or validating the data.

RESULTS

This research indicates that teachers of elementary schools prioritize two themes when developing learning media using artificial intelligence, as illustrated in Figure 1.

Teacher Views About the Use of AI in Developing Learning Media

The primary benefit of integrating AI into educational activities in the classroom is that it can boost motivation levels for both educators and learners. Instructors can quickly locate resources for quick and creative lesson plans, and AI can also analyze data to determine the needs of the students. AI applications can also help pupils find answers to problems they are unsure of. Aside from that, AI has altered how educators organize and carry out instruction. Teachers may use AI to automate administrative duties like lesson scheduling, student attendance tracking, and the creation of tailored learning materials. This frees teachers to concentrate on

deeper human interactions with students, like giving them personalized feedback, fostering meaningful class discussions, and igniting their curiosity.
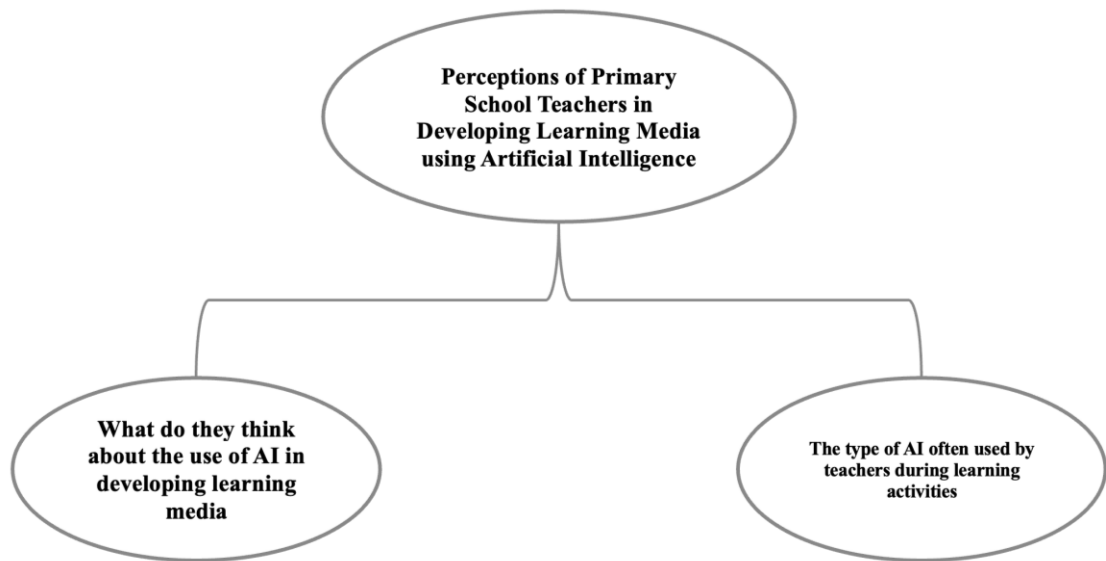
Figure 1. Research themes on elementary school teachers' perceptions of using artificial intelligence as a learning tool

By using AI technology in our learning platform, we can provide learning experiences tailored to individual needs and levels of understanding. AI can also analyze data collected from each student and provide learning experiences. Artificial intelligence (AI) based learning is a learning method that uses AI technology to optimize the process of students' understanding of concepts. AI-based learning can help students increase interest and motivation in learning, improve critical thinking skills, and improve problem-solving abilities.

When teachers carry out learning that applies interactive media, they use various application options provided, which are adapted to the type of material being taught. Adami, developing learning media using AI can attract students to learn and understand the material. Improved student learning outcomes indicate greater student understanding of the learning material. This shows that using technology as a learning tool is effective and efficient.

Besides that, AI can help teachers provide feedback on classroom learning and recommendations on what needs to be studied again. Learning media using AI can be interpreted as an intermediary tool for two-way communication between the sender and recipient. Through this media, a person can carry out various educational activities. Educational activities in art learning using AI media are simple interactive media that can increase the creativity of teachers and students. Understand the concepts and applications of artificial intelligence (AI) in digital learning, develop more interactive and effective AI-based learning content, Optimize online learning experiences to increase participant retention and engagement, and

Follow the latest developments in AI technology and apply them in learning contexts—the respondents' responses regarding Implementing Artificial Intelligence in Making Learning Media.

> *I have been greatly helped by AI technology in developing learning media. Things I do are like making media from AI applications on the internet; in the implementation, I am enthusiastic about teaching because I find it easy to explain the teaching material being delivered; from the student side, I also see students actively asking questions and expressing opinions when I teach using the media I designed it with AI assistance (Respondent JW)*

> *I do the media that I develop with the help of AI according to the learning objectives. In implementing this media, I always explain first that the media used is a technological development to apply technological literacy to students. Students' enthusiasm for learning new things can be stimulated through digital learning materials. This AI-based media attracts stimulation for students in the learning process. Because nowadays, many platforms are creative in creating learning media so that many students are attracted to learning (Respondent VI)*

> *I am committed to being creative in creating learning media with the help of AI because of my experience of learning and teaching with the help of AI so that students do not get bored while learning. Because students will become more interested in participating in learning, this will improve student learning outcomes (WWA Respondent)*

Although AI has great potential in education, it also has challenges that must be overcome. One of the biggest challenges is concerns regarding data privacy and the ethics of using AI for learning. Student data must be treated securely and used ethically to improve the learning experience without violating privacy or discrimination... It is also essential to develop new skills among educators to properly integrate AI technologies into learning. Adequate training and support are needed to ensure teachers have the knowledge and skills to harness the power of AI in education.

The type of AI often used by teachers during learning activities

AI that teachers often use is (a) Canva, which is one of the most popular graphic design tools that also utilizes artificial intelligence. It provides thousands of templates that teachers can use to create engaging visual learning materials. Canva also uses AI to provide design suggestions that help make content more professional. (b) Lumen5 is an excellent tool for teachers to turn text into videos quickly. (c) Crello is another graphic design tool that can help teachers create dynamic learning materials. It has various animated elements and templates that can be used to create more engaging content. (d) Powtoon is a tool that allows teachers to create exciting animations for presentations and learning materials. With various characters and animated elements available, Powtoon makes learning more entertaining. (e) Quizlet is a tool that uses AI to help teachers create digital flashcards and online quizzes. Teachers can create interactive learning resources to

help students understand concepts better (f) Chat GPT (Generative Pre-training Transformer) is an application that is very often used by teachers today.

According to teachers, Chat GPT makes it easy for them to find answers they want to know; even with GPT chat, they feel that they no longer have difficulties or forget the material they will convey. The AI system in the GPT chat application makes it easy to interact in text-based conversations. This GPT Chat has functions, including language translation, to provide recommendations. GPT Chat offers benefits such as personalized learning, accessibility and affordability during learning, and interactive learning resources.

DISCUSSION

The approach that education is conducted has changed as a result of information technology's intervention. By offering a wide range of educational material, technology may support teaching and learning activities in more complicated ways. For instance, audio and video content can be seen on PCs, LCD panels, tablets, or mobile phones. Every year, AI technology progresses. AI is present in many sectors of human existence, including education, and its characteristics, functions, and new features are influencing these aspects of life more and more. Since AI can solve problems and serve as a source of information for educators and students, it is currently beginning to be used in educational activities. Moreover, using AI is seen as a technological advancement that will help the field of learning technology continue to grow (Abidin, 2023).

AI-based learning systems provide personalized learning by personalizing learning content and activities based on student's needs and development. This system uses machine learning algorithms to analyze student performance data and adjust learning strategies as needed. According to Zhang and Zhang (2022), AI-based learning systems optimize the learning experience by providing personalized learning opportunities and adapting learning materials based on the student's level of proficiency.

Artificial intelligence technology has not been utilized optimally in education, especially in learning support. Even in today's competitive times, schools and universities have not implemented technology in their teaching and learning processes. Artificial intelligence technology has not been utilized optimally in education, especially to support learning. (Abidin, 2023). Currently, educational levels or schools must take advantage of technological advances to make the work of teachers and students easier. Schools can use applications or platforms to optimize tasks, such as providing feedback and selecting appropriate learning materials. AI technology is very effective in improving the quality and pattern of learning compared to content and effectiveness. In education, it can provide many benefits and advantages to improve academic performance in various situations,

especially in learning in elementary schools. It has been proven that the application of AI media can significantly improve the quality and effectiveness of learning (Dieterle et al., 2024).

Apart from being used to develop learning platforms that make it easier for teachers to convey information to students, AI can also be used to create activities that sharpen students' critical thinking and cognitive skills. AI can adjust the difficulty level of questions, providing additional resources according to learner needs and desires. This allows students to learn at a pace and style that suits them.

CONCLUSION

Integrating AI in education introduces new opportunities for customization and adaptability in the learning process. AI offers various positive impacts when applied in educational environments. One significant contribution of AI to education is its ability to individualize instruction by aligning teaching methods with each student's specific needs. By analyzing data, AI can assess each student's level of understanding and tailor the learning materials to suit their requirements. The study identified two main research issues based on its findings: the types of AI frequently utilized by educators in their lesson plans and their perspectives on using AI in developing educational resources. The study's findings demonstrate that AI supports learning activities and can provide personalized learning experiences tailored to individual students. This is where the application of AI in creating educational materials can be advantageous. Moreover, using AI in education enhances administrative and operational efficiency, allowing teachers to dedicate more time to student engagement. The use of AI and interactive learning materials such as interactive modules, educational videos, and digital textbooks can be created to cater to the unique needs of each student.

ACKNOWLEDGMENTS

REFERENCES

Abidin, M. A. (2023). Implementasi Teknologi Artificial Intelligence (AI) untuk Mendukung Pembelajaran Siswa di Madrasah Ibtidaiyah Kecamatan Krembung Sidoarjo. *Jurnal Madrasah Ibtidaiyah*, *2*(1), 88-95.

Adiawan, D. (2023). Pro dan Kontra AI dalam Pendidikan dan Dampaknya terhadap Guru di Tahun 2023. *Accessed on* https://www.classpoint.io/blog/id/pro-dan-kontra-ai-dalam-pendidikan-dan-dampaknya-terhadap-guru-di-tahun-2023

AI-Based Approaches. Language Teaching Research, 26(1), 34-52.

Alkhalifi, Y., Rizal, K., Alam, N., & Amir, A. (2024). Pemanfaatan Dan Peningkatan Kewaspadaan Teknologi Artificial Intelligence Bagi Karang Taruna Tegal Parang, Jakarta Selatan. *Jurnal Pengabdian Kolaborasi dan Inovasi IPTEKS*, *2*(3), 797-805.

Amandha, A., Rahayu, A., Mariana, D., Wahyuni, I., & Romadhoni, R. D. (2023, October). Implementasi Artificial Intelligence dalam Pembuatan Media Pembelajaran Berbasis Augmented Reality. In *Prosiding Seminar Nasional Pendidikan FPMIPA* (Vol. 1, No. 1, pp. 240-243).

Apriadi, R. T., & Sihotang, H. (2023). Transformasi Mendalam Pendidikan Melalui Kecerdasan Buatan: Dampak Positif bagi Siswa dalam Era Digital. *Jurnal Pendidikan Tambusai*, *7*(3), 31742-31748.

Clarizia, F., Colace, F., Lombardi, M., Pascale, F., & Santaniello, D. (2018). Chatbot: An Education Support System for Student. Dalam A. Castiglione, F. Pop, M. Ficco, & F. Palmieri (Ed.), Cyberspace Safety and Security (Vol. 11161, hlm. 291–302). Springer International Publishing. https://doi.org/10.1007/978-3-030-01689- 0_23

Cunningham-Nelson, S., Boles, W., Trouton, L., & Margerison, E. (2019). A review of chatbots in education: Practical steps forward. Dalam 30th Annual Conference for the Australasian Association for Engineering Education (AAEE 2019): Educators Becoming Agents of Change: Innovate, Integrate, Motivate (hlm. 299–306). Engineers Australia. https://search.informit.com.au/documentSummary;dn=068364390172788;res=IELENG

de Souza, A. S. C., & Debs, L. (2024). Concepts, innovative technologies, learning approaches and trend topics in education 4.0: A scoping literature review. *Social Sciences & Humanities Open*, *9*, 100902. https://doi.org/10.1016/j.ssaho.2024.100902

Dehouche, N. (2021). Plagiarism in the age of massive Generative Pre-trained Transformers (GPT-3). Ethics in Science and Environmental Politics, 21, 17–23.

Dewanto, A. C. (2023). Resiko dan Mitigasi Penggunaan Kecerdasan Buatan Dalam Bidang Pendidikan. *Prosiding Konferensi Ilmiah Pendidikan*, *4*, 1-10.

Dieterle, E., Dede, C., & Walker, M. (2024). The cyclical ethical effects of using artificial intelligence in education. *AI & society*, *39*(2), 633-643. https://doi.org/10.1007/s00146-022-01497-w

Johnson, R. (2019). The Potential of AI in Language Education. Journal of Educatlonal Technology, 42(3), 187-203.

Karsenti, T. (2019). Artificial intelligencein education:The urgent need to prepareteachers for tomorrow'sschools. Formation et profession, 27(1), 105. https://doi.org/10.18162/fp.2019.a166

Khan, I., Ahmad, A. R., Jabeur, N., & Mahdi, M. N. (2021). An artificial intelligence approach to monitor student performance and devise preventive measures. Smart Learning Environments, 8(1), 17. https://doi.org/10.1186/s40561-021-00161-y

Kim, H.-S., Kim, N. Y., & Cha, Y. (2021). Is It Beneficial to Use AI Chatbots to Improve Learners' Speaking Performance? The Journal of AsiaTEFL, 18(1), 161–178. https://doi.org/10.18823/asiatefl.2021.18.1.10.161

Lee, S. (2020). Integrating AI in Language Education: Adaptive Learning, Personalized Instruction, and Targeted Feedback. International Journal of Applied Linguistics, 18(2), 89-105

Lin, M. P.-C., & Chang, D. (2020). Enhancing Post-secondary Writers' Writing Skills with a Chatbot: A Mixed Method Classroom Study. Journal of Educational Technology & Society, 23(1), 78–92.

Rachmadtullah, R., Purnaningrum, E., & Suharni, S. (2023). Elementary School Students' Perceptions of STEM-Based Mobile Learning Applications. *Al Ibtida: Jurnal Pendidikan Guru MI*, *10*(2).

Rachman, A. F., Ridwan, D. A., Damarudin, S., & Saifudin, A. (2023). Kecerdasan Buatan Dalam Otomatisasi Pengujian Perangkat Lunak E-Commerce. OKTAL: Jurnal Ilmu Komputer dan Sains, 2(06), 1742-1746. https://www.journal.mediapublikasi.id/index.php/oktal/article/view/3093

Rodríguez-Abitia, G., Martínez-Pérez, S., Ramirez-Montoya, M. S., & Lopez-Caudana, E. (2020). Digital gap in universities and challenges for quality education: A diagnostic study in Mexico and Spain. *Sustainability*, *12*(21), 9069. https://doi.org/10.3390/su12219069

Sabella, B., Rhomadhona, H., & Arrahimi, A. R. (2023). Pelatihan pembuatan game sederhana sebagai media pembelajaran untuk pengajar smp berbasis artificial intelegent. Jurnal Widya Laksmi: Jurnal Pengabdian Kepada Masyarakat, 3(2), 69-76. https://doi.org/10.59458/jwl.v3i2.59

Saputra, A. B. (2023). *Peran AI dalam Dunia Pendidikan*. CV Brimedia Global.

Sperling, K., Stenberg, C. J., McGrath, C., Åkerfeldt, A., Heintz, F., & Stenliden, L. (2024). In search of artificial intelligence (AI) literacy in Teacher Education: A scoping review. *Computers and Education Open*, 100169. https://doi.org/10.1016/j.caeo.2024.100169

Winkler, R., & Soellner, M. (2018). Unleashing the Potential of Chatbots in Education: A State-Of-The-Art Analysis. Academy of Management Proceedings, 2018(1), 15903. https://doi.org/10.5465/AMBPP.2018.15903

Xia, Q., Chiu, T. K. F., Lee, M., Sanusi, I. T., Dai, Y., & Chai, C. S. (2022). A self-determination theory (SDT) design approach for inclusive and diverse artificial intelligence (AI) education. Computers & Education, 189, 104582. https://doi.org/10.1016/j.compedu.2022.104582

Zahara, R., Prasetyo, G. E., & Yanti, D. M. (2021). Kajian literatur: gamifikasi di pendidikan dasar. *SOKO GURU: Jurnal Ilmu Pendidikan*, *1*(1), 76-87.

Zhang, Y., & Zhang, H. (2022). Adaptive Learning Systems in English Teaching: A Review of AI-Based Approaches. Language Teaching Research, 26(1), 34-52.