Jurnal of English Development Vol.3, No.01, Febrary 2023, pp. 228~242
ISSN: 2776-088x

Navigating the Nexus of English Education and Artificial Intelligence: Opportunities and Challenges

Rizky Hidayatullah*[1]
[1,2] Universitas Ma'arif Lampung, Indonesia
e-mail: *[1] rizkyiaimnu@gmai.com

Abstract

Education integration with Artificial Intelligence (AI) has brought to transformative change. The issue of Artificial Intelligence (AI) technology in the field of education, as discussed by various researchers this study delves into the intricate interplay between English education and AI. A mixed-methods approach was used to investigate the relationship between English education and AI. The research design included both qualitative and quantitative methodologies. The research instrument utilized a questionnaire distributed to 30 participants. These participants comprised students from the English Language program, English Language faculty members, and an AI specialist from the Doctor of Education Technology department. incorporating AI technology into English language learning provides several benefits, including faster and more efficient learning, a broader understanding, and the ability to know more. Students report that the most significant benefit of using AI technology for English learning is that it makes learning easier and more efficient. However, there are some drawbacks to using AI technology in English language learning, such as signal strength or slow Wi-Fi, the fear of humans becoming dependent on AI, and the need for more advanced technology.

Keyword: Artificial Intelligence (AI), Education , English Courses

1. INTRODUCTION

The integration of Artificial Intelligence (AI) into the field of education has brought about transformative changes(Schachner, 2020), and English language education is no exception(Zhang, 2021). This study delves into the intricate interplay between English education and AI(Luan, 2021), examining the opportunities and challenges that arise in this nexus(Carter, 2006). As technology advances at an unprecedented pace, educators and researchers must navigate this evolving landscape(Wu, 2020) to harness the full potential of AI in enhancing language learning outcomes(Ng, 2021). This paper aims to shed light on the multifaceted dimensions of this relationship(Zhang, 2021), ultimately contributing to the development of effective strategies for integrating AI into English education(Cotton, 2023).

The issue of Artificial Intelligence (AI) technology in the field of education, as discussed by various researchers (Zhai, 2021) s highly relevant and encompasses several critical aspects. One of the primary concerns is the inequality in access to AI technology in education, particularly in schools or

regions with limited resources (Cotton, 2023) his inequality can result in a digital divide in education, hindering educators from keeping up with students' capabilities (Mhlanga, 2021). Consequently, AI can create a gap between educators and students(Mendelson, 2019). herefore, for successful implementation of AI-based learning (Kitto, 2019), all aspects within educational institutions must support the adoption of AI technology (Chiu, 2020). This includes teacher training in the use of AI for subjects (Ciolacu, 2018) and the availability of technology in schools, such as internet access and computers (Luan, 2020).

The next issue concerns the potential illegal use of AI technology in teaching and learning, where it may collect student data (Yang, 2021) Data privacy becomes a significant concern (Chen, 2022). especially when students' personal data can be exploited or misused (Knox, 2020), urthermore, with the rise of cybercrimes related to advanced technology, users often feel their data is insecure (Zawacki-Richter, 2019). when using new or foreign technologies (Amershi, 2019). With numerous cybercrimes like data breaches and illegal online lending occurring, the widespread use of AI remains a daunting prospect for schools, teachers, and students (Carbonell, 1970)

There is a concern that the use of AI in teaching may replace the role of teachers (Osadchy, 2017). However, most successful approaches involve collaboration between teachers and AI technology(Aleven, 2003) A lack of training and understanding of this technology can be a barrier, even though AI can provide personalized learning content recommendations (Kasneci, 2023). There are concerns that not all content generated by this technology is of high quality(Qu, 2021), depending on what is needed and developed within AI technology(Kolachalama, 2018) Another fear is that AI technology could diminish students' critical thinking and creativity if not used wisely (Lee, 2023). leading to concerns about unemployment (Kim, 2018) jika tidak digunakan dengan bijak(Chatterjee, 2020) here is also concern that the use of AI technology in education and teaching could replace the jobs of teachers or other instructors (Górriz, 2020). From the above issues, researchers face several challenges in answering the following questions::

1. What opportunities can be maximized concerning AI technology in English courses?
2. What challenges can be addressed by educational institutions, teachers, and students in the era of AI technology?

2. RESEARCH METHODOLOGY

Participants

The participants in this research were third, fifth, and seventh-semester students of English Language Education, as well as faculty members of the English Language Education program. To reinforce the findings, the

researcher sought the opinion of an AI expert from the Doctor of Education Technology department through an interview.

Instruments and Data Analysis

The research instrument utilized a questionnaire distributed to 30 participants. These participants comprised students from the English Language program, English Language faculty members, and an AI specialist from the Doctor of Education Technology department. Additionally, interviews were conducted with a sample of students, English Language faculty, and the AI specialist. Data analysis was carried out using Nvivo 12, and the questionnaire was distributed using Google Forms.

Procedure

A mixed-methods approach was used to investigate the relationship between English education and AI. The research design included both qualitative and quantitative methodologies, allowing for a thorough understanding of the subject matter. Semi-structured interviews with educators, AI specialists, and students who had used AI-assisted language learning were conducted during the qualitative phase. Their perspectives provided valuable qualitative data on the perceived benefits, challenges, and nuances of incorporating artificial intelligence into English education. Furthermore, quantitative data were collected via surveys distributed to a diverse group of language learners, measuring their preferences, perceptions, and learning outcomes when AI tools were used in their English instruction

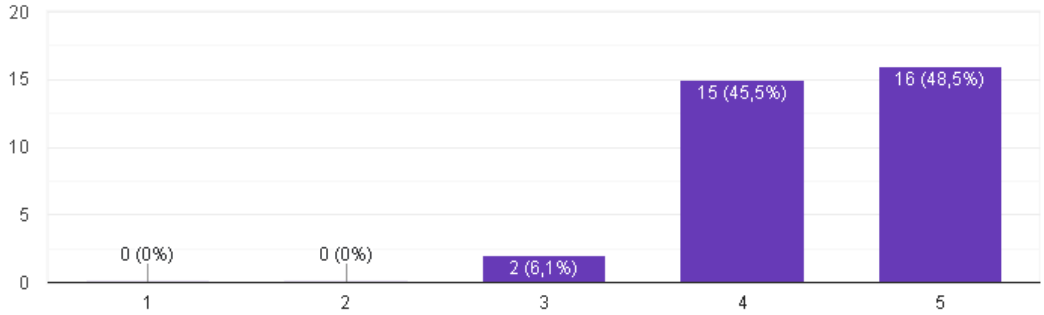
3. RESULT AND DISCUSSION

The results were obtained after carrying out research, with data taken from questionnaires, and interviews with English language education students at the University of Lampung, English lecturers and IA experts from educational technology doctors.

The criteria for students asked to fill out the questionnaire are:

1. Students have used AI Technology
2. Students know the function of using AI
3. Students can maximize the use of AI for English language material

From the indicators above, the following results are obtained.



The figure demonstrates the effectiveness of using AI in English language learning. According to the results of the questionnaire, 48.5% of students strongly agree that AI significantly aids them in improving their English language skills. Additionally, 45.5% of respondents agree that the use of AI is effective in enhancing their English language development. A smaller percentage, 6.1%, indicated that they have a neutral stance regarding the use of AI technology. In recent years, the integration of artificial intelligence (AI) into education has become increasingly prominent. This figure indicates that a significant portion of students finds AI to be a valuable tool in their pursuit of English language proficiency.

The fact that 48.5% of respondents strongly agree with the statement indicates that a significant number of students have reaped significant benefits from using AI for language learning. This could be attributed to artificial intelligence's ability to provide personalized learning experiences, adapt to individual learning styles, and provide instant feedback on language skills. Furthermore, AI-powered language learning platforms frequently include interactive exercises, real-time translations, and speech recognition technologies to help students improve their English language skills.

The 45.5% agreement rate lends credence to the notion that AI plays a significant role in language development. These respondents recognize AI's effectiveness in assisting their English language progression. AI's availability 24/7, allowing students to practice and learn at their own pace, as well as its capacity to provide an abundance of resources, such as language exercises, quizzes, and language comprehension tools, could be reasons for their agreement.

The 6.1% of respondents who expressed neutrality toward AI in language learning could point to a need for additional research or better implementation of AI-based tools. These students may not have fully appreciated the potential benefits of AI for language acquisition or may be skeptical of its efficacy. Understanding their perspectives can help to improve AI-powered language learning solutions.

The 6.1% of respondents who said they were neutral about AI in language learning could indicate a need for more research or better implementation of AI-based tools. These students may have underestimated the potential benefits of AI for language acquisition or may be skeptical of its effectiveness. Understanding their points of view can aid in the development of AI-powered language learning solutions.

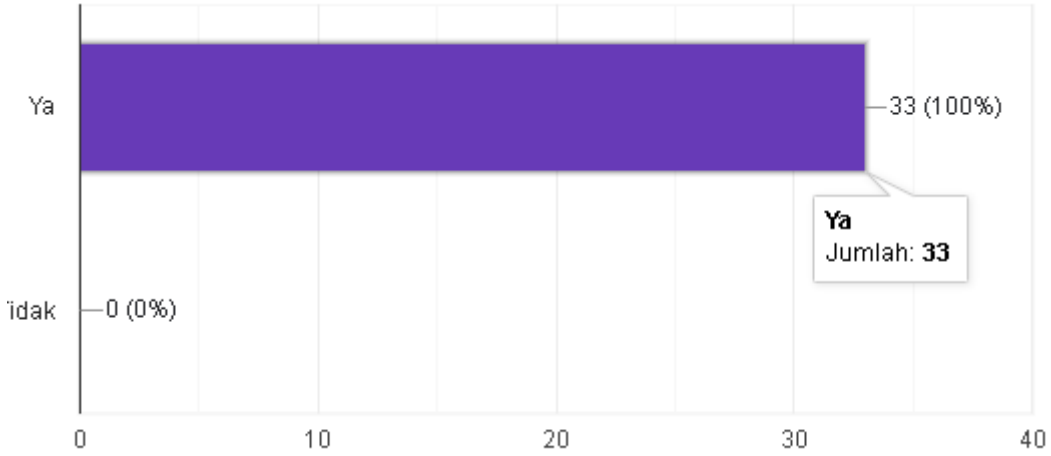


Figure 2 - AI Assisting in English Language Comprehension

The data above illustrates that 100% of the students feel that AI significantly aids in improving their English language skills. Furthermore, students consistently rely on AI to complete English language assignments.

The findings presented in Figure 2 are remarkable and suggest a unanimous consensus among the students regarding the effectiveness of AI in enhancing their English language abilities. The fact that every single respondent, constituting 100% of the sample, perceives AI as highly beneficial is a compelling testament to the power of AI in language learning.

This overwhelming support for AI is most likely due to the numerous benefits that AI provides in the context of language acquisition. Students may value AI's ability to provide instant feedback on grammar, pronunciation, and vocabulary, which can assist them in correcting errors and improving their language skills. AI can also provide a variety of resources, such as interactive lessons, quizzes, and language comprehension exercises, which can make the learning process more engaging and dynamic.

Furthermore, the students' reliance on AI for English language assignments indicates that AI technology has been integrated into their daily academic activities. This suggests that artificial intelligence (AI) has become an indispensable tool in their language learning journey, playing a critical role in homework completion, essay writing, and other language-related tasks.

The 100% agreement rate indicates a high level of satisfaction and trust in artificial intelligence technology for language learning. Such a unified opinion emphasizes the importance of continuing to harness AI's potential in education, ensuring that it remains a useful and accessible tool for students looking to improve their English language skills.

In conclusion, Figure 2 depicts the overwhelming consensus among students, with every respondent recognizing AI's invaluable role in their English language development. This result emphasizes the critical role of AI in language education and emphasizes the need to further refine and expand AI-driven solutions to meet students' evolving needs in their pursuit of language proficiency.

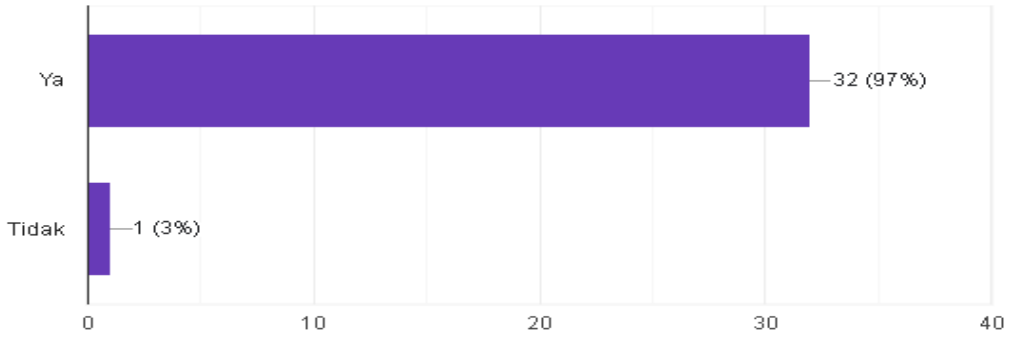


Figure 3 - Motivation for Using AI in Understanding English

The figure provides insights into the motivation of students for utilizing AI to enhance their skills and complete English language assignments. It is evident that a high percentage of students, 97%, are motivated to use AI for their English language assignments and to improve their English language proficiency. In contrast, 3% of students express a lack of motivation to use AI technology for English language tasks and language skill improvement.

The high level of motivation observed among 97% of the students demonstrates a strong interest in and commitment to leveraging AI for language learning and academic success. This motivation could be attributed to a variety of factors, including:

1. Students may have had positive outcomes from using AI in their English language studies, such as improved grades or improved language skills, which serve as motivators.
2. AI-powered tools frequently offer on-demand assistance, making it easier for students to work on assignments and improve their language skills at any time.
3. Artificial intelligence (AI) can provide interactive and engaging language learning experiences, making the process more enjoyable and motivating.

4. AI can provide instant feedback, allowing students to track their progress and identify areas for improvement, which can be beneficial.

The 3% of students who express a lack of motivation may be concerned about the use of AI technology in language learning. It is critical to understand their point of view and address any concerns or roadblocks they may encounter. This feedback can be useful in improving the design and implementation of AI-driven language learning solutions to meet the needs and motivations of a broader range of students.

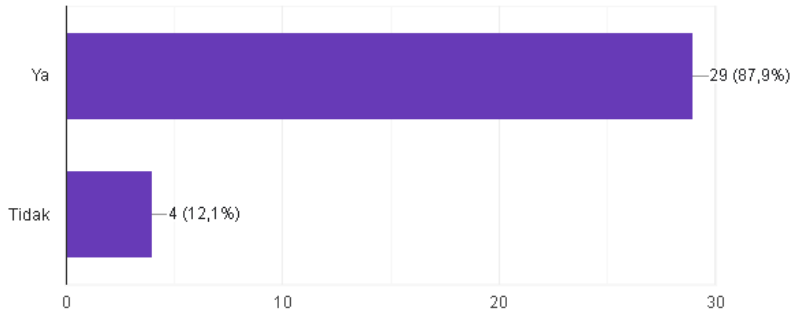


Figure 4 Using AI in English Learning

The rate of AI usage in English language learning shows that 87% always use AI when working on English and practicing the language. Meanwhile, 12.1% are not yet accustomed to using AI for English language learning.

4.1. AI Expert Interview:

X	In your opinion, what are the main opportunities offered by the integration of AI technology in English learning?
y	**The integration of AI in English learning offers several opportunities. It can provide personalized learning experiences for students, adapt content based on learners' proficiency levels, and offer instant feedback. Additionally, AI can facilitate flexible learning hours through chatbots or virtual assistants, making education accessible anytime and anywhere.**
X	What is the biggest benefit you feel from the use of AI technology in English learning?
y	**The most significant benefit of AI in English learning is its ability to cater to individual learning paces and needs. With AI, learners can receive real-time corrections, insights into their strengths and weaknesses, and adaptive content, enhancing their learning journey and ensuring more effective language acquisition.**
X	How do you think the role of teachers in English learning will change with the adoption of more AI technology?
Y	**Some challenges include the risk of over-reliance on AI, which may decrease human-to-human interaction essential for language practice. Additionally, not all AI tools are perfectly accurate, and there might be nuances in language and cultural contexts that they might miss. Moreover, not every learner has equal access to advanced AI tools due to socio-economic disparities.**
X	How do you think the role of teachers in English learning will change with the adoption of more AI technology?

Y	**The role of teachers will evolve rather than diminish. While AI can handle content delivery and basic queries, teachers will focus more on cultivating critical thinking, cultural understanding, and nuanced language use. Their role will shift towards being facilitators and mentors, guiding students in their language journey rather than merely being content deliverers.**
X	How do you see the future of the use of AI technology in English learning?
Y	**The future of AI in English learning looks promising. As the technology improves, we can expect more sophisticated tools that understand and cater to individual learners better. These advancements will lead to more effective and enjoyable language learning experiences. However, the importance of human interaction and cultural immersion will remain paramount.**

The study's findings revealed a variety of opportunities that arise from the incorporation of AI in English education. Participants expressed enthusiasm for AI-driven personalized learning experiences, emphasizing AI tools' adaptability to individual learning styles and paces. AI-powered applications frequently include interactive elements that pique learners' interest, resulting in increased engagement and motivation. Additionally, AI-assisted language learning was linked to improved linguistic accuracy, fluency, and retention. Participants who received AI-assisted instruction reported improvements in their overall language proficiency levels. However, there were some difficulties in this landscape. Concerns have been raised about the potential dehumanization of education as a result of an overreliance on AI. Privacy and data security have emerged as major concerns, particularly when AI platforms collect sensitive data. Technical barriers, such as limited access to technology and AI-related resources, posed challenges for equitable implementation across diverse learning environments.

DISCUSSION

The juxtaposition of opportunities and challenges emphasizes the importance of integrating AI into English education in a balanced and nuanced manner. While AI technologies have the potential to improve learning outcomes, ethical considerations must guide their implementation. Personalization, which is at the heart of many AI applications, must be approached with sensitivity to individual learners' needs and preferences, ensuring that the human touch in education is preserved.

Strategies for dealing with problems must also be carefully considered. Collaboration between educators, AI developers, and policymakers is essential for establishing strong data protection measures and ensuring equitable access to AI-powered resources. Furthermore, educational institutions must provide adequate training and support to educators in order for AI tools to be effectively integrated into their teaching practices.

Problem-solving strategies must also be carefully considered. Collaboration among educators, AI developers, and policymakers is critical for implementing strong data protection measures and ensuring equitable access to AI-powered resources. Furthermore, in order for AI tools to be effectively integrated into educators' teaching practices, educational institutions must provide adequate training and support.

Discussion on the Interview about AI in English Learning

The interview focused on the potential impacts, benefits, and challenges of incorporating AI into English learning, as well as the implications for teachers and students in the future. The following are some key takeaways from the interview:

AI Provides Opportunities for English Learning:

The incorporation of AI in English education provides a plethora of opportunities that have the potential to reshape how students learn. The emphasis on personalized learning was especially noteworthy. The ability of AI to tailor content to individual learners' proficiency levels has the potential to significantly improve the overall learning experience. The mention of AI enabling flexible learning hours via chatbots or virtual assistants emphasizes how AI can democratize learning by making it available 24 hours a day, seven days a week.

Benefits of AI Integration: As previously stated, the primary benefit is AI's ability to adjust to individual learning paces. Personalization, in conjunction with real-time feedback and insights into learners' strengths and weaknesses, represents a shift toward more adaptive and responsive education systems.

Teachers' Role in an AI-Driven Environment:

The interviewee's response emphasizes an important point: while AI will be useful for delivering content and answering basic questions, it will not replace the human touch in education. Teachers will play a more important role in encouraging critical thinking, cultural insights, and a thorough understanding of linguistic nuances. The shift toward teachers serving as facilitators and mentors reflects the changing dynamics of classroom learning, in which technology and human interaction will complement each other.

Challenges and Concerns:

The potential over-reliance on AI, which could reduce essential humanto-human interactions required for effective language learning, was raised as a major concern. Language nuances, particularly in a subject like

English, which is so intertwined with culture and context, may be missed by AI tools.

Due to socioeconomic disparities, access to advanced AI tools remains a concern, emphasizing the need for equitable distribution of educational resources.

Future of AI in English Learning:

The interviewee painted a bright future, emphasizing the ongoing advancement of AI technology. As artificial intelligence tools advance, they will provide more effective and enjoyable learning experiences. The importance of human interaction and cultural immersion, on the other hand, was emphasized, indicating that while AI will be a powerful tool, the human element in education will remain indispensable.

To summarize, the incorporation of AI into English learning is an exciting frontier with numerous benefits, but it also has its challenges. The key to unlocking AI's full potential will be to balance its strengths with the human touch of educators.

4. CONCLUSION

According to the questionnaire responses, incorporating AI technology into English language learning provides several benefits, including faster and more efficient learning, a broader understanding, and the ability to know more. Students report that the most significant benefit of using AI technology for English learning is that it makes learning easier and more efficient. However, there are some drawbacks to using AI technology in English language learning, such as signal strength or slow Wi-Fi, the fear of humans becoming dependent on AI, and the need for more advanced technology.

Even as more AI technology is adopted, the role of teachers in English language learning remains important, as AI is only a supplement to the teacher's role. The future of AI in English language learning looks bright, with the hope of using AI technology more wisely and with even smarter and more advanced AI in English language learning. Overall, the incorporation of AI technology in English language learning provides students with numerous opportunities to learn more efficiently and effectively. However, the challenges and ethical concerns associated with the use of AI technology in education must be addressed. The role of teachers in English language learning will remain critical, and the use of AI technology should be encouraged

ACKNOWLEDGEMENT

The researcher is very grateful for all the guidance, support and help, especially from the institution, parents and friends. In addition, the researcher would also like to thank the students of English Education Program of University of Ma'arif Lampung who participated in this study for their involvement and support in enabling the researcher to complete this study. The findings of this study are expected to be useful to future researchers or readers, especially in the field of education.

REFERENCES

Aleven, V. (2003). Using background knowledge in case-based legal reasoning: A computational model and an intelligent learning environment. *Artificial Intelligence*, *150*(1), 183–237. https://doi.org/10.1016/S0004-3702(03)00105-X

Carbonell, J. R. (1970). AI in CAI: An Artificial-Intelligence Approach to Computer-Assisted Instruction. *IEEE Transactions on Man-Machine Systems*, *11*(4), 190–202. https://doi.org/10.1109/TMMS.1970.299942

Carter, B. (2006). "One expertise among many"" working appreciatively to make miracles instead of finding problems: Using appreciative inquiry as a way of reframing research. *Journal of Research in Nursing*, *11*(1), 48–63. https://doi.org/10.1177/1744987106056488

Chatterjee, S. (2020). Adoption of artificial intelligence in higher education: a quantitative analysis using structural equation modelling. *Education and Information Technologies*, *25*(5), 3443–3463. https://doi.org/10.1007/s10639-020-10159-7

Chen, X. (2022). Two Decades of Artificial Intelligence in Education: Contributors, Collaborations, Research Topics, Challenges, and Future Directions. *Educational Technology and Society*, *25*(1), 28–47.

Chiu, T. K. F. (2020). Sustainable curriculum planning for artificial intelligence education: A self-determination theory perspective. *Sustainability (Switzerland)*, *12*(14). https://doi.org/10.3390/su12145568

Cotton, D. R. E. (2023). Chatting and cheating: Ensuring academic integrity in the era of ChatGPT. *Innovations in Education and Teaching International*. https://doi.org/10.1080/14703297.2023.2190148

Gonzalez, B. (2021). Application of Language Technologies to Assist English Teaching. *Proceedings - International Conference of the Chilean Computer Science Society, SCCC, 2021*. https://doi.org/10.1109/SCCC54552.2021.9650395

Górriz, J. M. (2020). Artificial intelligence within the interplay between natural and artificial computation: Advances in data science, trends and applications. *Neurocomputing*, *410*, 237–270. https://doi.org/10.1016/j.neucom.2020.05.078

Hang, Y. (2022). Assessing English teaching linguistic and artificial intelligence for efficient learning using analytical hierarchy process and Technique for Order of Preference by Similarity to Ideal Solution. *Journal of Software: Evolution and Process*. https://doi.org/10.1002/smr.2462

International Conference on Machine Learning and Big Data Analytics for IoT Security and Privacy, SPIoT 2020. (2021). *Advances in Intelligent Systems and Computing*, *1283*.

Kadam, D. M. (2023). Task Based Approach: An Approach to Develop Writing Skills in English of Engineering Students Leads to Effective Communication Skills. *Journal of Engineering Education Transformations*, *37*(1), 62–69. https://doi.org/10.16920/jeet/2023/v37i1/23132

Kasneci, E. (2023). ChatGPT for good? On opportunities and challenges of large language models for education. *Learning and Individual Differences*, *103*. https://doi.org/10.1016/j.lindif.2023.102274

Kim, Y. (2018). Towards Emotionally Aware AI Smart Classroom: Current Issues and Directions for Engineering and Education. *IEEE Access*, *6*, 5308–5331. https://doi.org/10.1109/ACCESS.2018.2791861

Kitto, K. (2019). Practical ethics for building learning analytics. *British Journal of Educational Technology*, *50*(6), 2855–2870. https://doi.org/10.1111/bjet.12868

Knox, J. (2020). Artificial intelligence and education in China. *Learning, Media and Technology*, *45*(3), 298–311. https://doi.org/10.1080/17439884.2020.1754236

Kolachalama, V. B. (2018). Machine learning and medical education. *Npj Digital Medicine*, *1*(1). https://doi.org/10.1038/s41746-018-0061-1

Kuddus, K. (2022). Artificial intelligence in language learning: Practices and prospects. *Advanced Analytics and Deep Learning Models*, 3–17. https://doi.org/10.1002/9781119792437.ch1

Lee, P. (2023). Benefits, Limits, and Risks of GPT-4 as an AI Chatbot for Medicine. *New England Journal of Medicine*, *388*(13), 1233–1239. https://doi.org/10.1056/NEJMsr2214184

Liao, L. (2023). Artificial Intelligence-based English Vocabulary Test Research Using Log Analysis with Virtual Reality Assistance. *Computer-Aided Design and Applications*, *20*, 23–39. https://doi.org/10.14733/cadaps.2023.S9.23-39

Luan, H. (2020). Challenges and Future Directions of Big Data and Artificial Intelligence in Education. *Frontiers in Psychology*, *11*. https://doi.org/10.3389/fpsyg.2020.580820

Luan, H. (2021). A Review of Using Machine Learning Approaches for Precision Education. *Educational Technology and Society*, *24*(1), 250–266.

Mageira, K. (2022). Educational AI Chatbots for Content and Language Integrated Learning. *Applied Sciences (Switzerland)*, *12*(7). https://doi.org/10.3390/app12073239

Mendelson, E. B. (2019). Artificial intelligence in breast imaging: Potentials and limitations. *American Journal of Roentgenology*, *212*(2), 293–299. https://doi.org/10.2214/AJR.18.20532

Mhlanga, D. (2021). Artificial intelligence in the industry 4.0, and its impact on poverty, innovation, infrastructure development, and the sustainable development goals: Lessons from emerging economies? *Sustainability (Switzerland)*, *13*(11). https://doi.org/10.3390/su13115788

Ng, D. T. K. (2021). Conceptualizing AI literacy: An exploratory review. *Computers and Education: Artificial Intelligence*, *2*. https://doi.org/10.1016/j.caeai.2021.100041

Osadchy, M. (2017). No Bot Expects the DeepCAPTCHA! Introducing Immutable Adversarial Examples, with Applications to CAPTCHA Generation. *IEEE Transactions on Information Forensics and Security*, *12*(11), 2640–2653. https://doi.org/10.1109/TIFS.2017.2718479

Pandey, A. (2022). Using AI and IoT to assess the efficacy of English-language curricula in higher education: A Proposed Method. *AIST 2022 - 4th International Conference on Artificial Intelligence and Speech Technology*. https://doi.org/10.1109/AIST55798.2022.10065284

Qu, Y. (2021). A Blockchained Federated Learning Framework for Cognitive Computing in Industry 4.0 Networks. *IEEE Transactions on Industrial Informatics*, *17*(4), 2964–2973. https://doi.org/10.1109/TII.2020.3007817

Sanabria-Navarro, J. R. (2023). Incidences of artificial intelligence in contemporary education. *Comunicar*, *31*(77). https://doi.org/10.3916/C77-2023-08

Schachner, T. (2020). Artificial intelligence-based conversational agents for chronic conditions: Systematic literature review. *Journal of Medical Internet Research*, *22*(9). https://doi.org/10.2196/20701

Srikanthan, P. (2020). Learning assistant to acquire the fundamental language skills for non-native learners using AI. *ICAC 2020 - 2nd International Conference on*

Advancements in Computing, Proceedings, 210–215. https://doi.org/10.1109/ICAC51239.2020.9357297

Wang, Y. M. (2023). Performance of ChatGPT on the pharmacist licensing examination in Taiwan. *Journal of the Chinese Medical Association*, *86*(7), 653–658. https://doi.org/10.1097/JCMA.0000000000000942

Wei, W. (2021). An Analysis of AI Technology Assisted English Teaching Based on the Noticing Hypothesis. *Proceedings - 2021 2nd International Conference on Artificial Intelligence and Education, ICAIE 2021*, 158–162. https://doi.org/10.1109/ICAIE53562.2021.00040

Wu, F. (2020). Towards a new generation of artificial intelligence in China. *Nature Machine Intelligence*, *2*(6), 312–316. https://doi.org/10.1038/s42256-020-0183-4

Yang, S. J. H. (2021). Human-centered artificial intelligence in education: Seeing the invisible through the visible. *Computers and Education: Artificial Intelligence*, *2*. https://doi.org/10.1016/j.caeai.2021.100008

Zawacki-Richter, O. (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). https://doi.org/10.1186/s41239-019-0171-0

Zhai, X. (2021). A Review of Artificial Intelligence (AI) in Education from 2010 to 2020. *Complexity*, *2021*. https://doi.org/10.1155/2021/8812542

Zhang, Y. (2021). Big data and artificial intelligence based early risk warning system of fire hazard for smart cities. *Sustainable Energy Technologies and Assessments*, *45*. https://doi.org/10.1016/j.seta.2020.100986

Zheng, F. (2022). Analyzing College Students' Reading Behavior by AI Techniques. *Applied Bionics and Biomechanics*, *2022*. https://doi.org/10.1155/2022/4214161

Zheng, H. (2021). Construction of College English Teaching Model in the Era of Artificial Intelligence. *Journal of Physics: Conference Series*, *1852*(3). https://doi.org/10.1088/1742-6596/1852/3/032017

Jurnal of English Development *Vol.3, No.01, Febrary 2023, pp. 228-242*
ISSN: 2776-088x