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University Students' Attitudes and Perceptions on Learning English with Mobile Apps

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A B S T R A C T

This study examines 43 master's students' perceptions of ChatGPT in English language learning at Universitas Negeri Yogyakarta. Using a descriptive quantitative methodology, data was gathered via questionnaires and interviews. Results show positive attitudes towards ChatGPT, with most students finding it user-friendly and beneficial for reading, writing, and cultural understanding. However, they are less confident in its ability to improve listening and speaking skills. Concerns include potential plagiarism, information leakage, and accuracy of content. Despite these issues, students find ChatGPT helpful and call for more structured guidance to enhance its integration into language learning. The study underscores the need for strategies to optimize ChatGPT's benefits while mitigating its limitations

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INTRODUCTION

The rapid development of technology has significantly changed the way we live, becoming an integral part of our daily lives and ushering in a new era in communication, automation and information processing. One important breakthrough in this regard is Artificial Intelligence (AI), which has transformed various industries, including the academic world. Natural Language Processing (NLP), a branch of AI that combines linguistics and computer science, has shown remarkable effectiveness in understanding context, interpreting and generating human language (Chowdhury, 2003).

Significant advances in NLP have led to advanced models such as Transformer, which leverages attention mechanisms to improve the ability to analyse and process text (Kasneci et al., 2023). One recent implementation of this technology is the Chat Generative Pre-trained Transformer (ChatGPT), developed by OpenAI. ChatGPT has attracted widespread attention for its remarkable ability to generate relevant and coherent responses in various contexts (Chan & Hu, 2023).

The impact of ChatGPT on academia is an important topic of discussion and research today. Its rapid development and wide adoption by students has created an urgency for educators and institutions to understand the technology more comprehensively, including its limitations (Kasneci, 2023). Several studies have shown the effectiveness of ChatGPT in promoting the development of critical thinking and problem-solving skills, as well as providing supplementary learning materials (Zawacki-Richter et al., 2019). However, there are also concerns regarding the potential for academic cheating and plagiarism (Kirk & Othmer, 1997).

Although ChatGPT has great potential in language learning in higher education, some experts note that its capabilities in Indonesian are still limited. Research by Rudolph et al. (2023) show that ChatGPT works very well with resource-rich European languages such as English and French, but lags far behind for resource-limited languages such as Indonesian.

This study aims to explore students' perceptions of the use of ChatGPT in English language learning at Universitas Negeri Yogyakarta. This study will investigate how students perceive the advantages and disadvantages of ChatGPT, providing important new insights into the integration of this technology in higher education in Indonesia. In addition to informing pedagogical strategies tailored to the needs of postgraduate English learners, this study also contributes to our understanding of the potential of AI-based chatbots such as ChatGPT in enhancing the language learning experience.

Nonetheless, the use of ChatGPT also poses new challenges and risks in education (Zhang & Aslan, 2021; Azaria, 2022; Kasneci, 2023). Its ability to provide precise answers to user requests raises concerns about the possibility of AI-based academic cheating (Lo, 2023). Educators worry that students will rely too much on ChatGPT to produce acceptable texts quickly (Mhlanga, 2023). In addition, concerns were raised about plagiarism, misinformation, and improper referencing (Sallam, 2023).

Therefore, further research on the use of ChatGPT and other AI-based educational tools is warranted. The rapid development of these technologies and their increasing integration into educational settings demands a better understanding of their potential benefits and risks. This study is expected to contribute to such understanding and assist in the development of policies and procedures for the ethical and responsible use of AI in education.

LITERATURE REVIEW

Artificial Intelligence (AI) has become a relevant technology trend to be developed for various purposes. AI is defined as a field of computer science that seeks to solve cognitive problems commonly associated with human intelligence, such as learning, problem solving, and pattern recognition (Fitria, 2021). The development of AI technology brings positive and negative impacts, not only used for serious things, but also for entertainment and helping everyday life.

One of the increasingly popular applications of AI is Chatbot technology, which is used in various industry platforms. A chatbot is a software application that uses natural language processing (NLP) and deep learning techniques to conduct text-based online conversations (Dharani et al., 2020). Communication between humans and computers has interested researchers for decades (Thorat & Jadhav, 2020).

OpenAI, founded in 2015, is a leading AI research lab based in San Francisco (Open AI, 2015). The organisation's main goal is to develop "artificial general intelligence" (AGI) capable of performing intellectual tasks on par with humans (Grace et al., 2018; Bostrom, 2017; McAfee & Brynjolfsson, 2017; Harari, 2016; Kurzweil, 2005; Searle, 1980).

In 2020, OpenAI launched the Generative Pre-Trained Transformer 3 (GPT-3), a groundbreaking achievement in artificial intelligence. GPT-3 was trained using an extensive dataset of hundreds of billions of words (equivalent to 45 terabytes of text), sourced from Common Crawl, WebText2, books (Books1 & Books2), and Wikipedia (Cooper, 2021). GPT-3 uses deep learning techniques to generate various forms of text, including essays, stories, poetry, and code.

On 30 November 2022, OpenAI introduced a free preview of ChatGPT, its latest AI chatbot, which led to a substantial increase in OpenAI's estimated value to US$29 billion (Jin & Kruppa, 2023; Hao, 2022; OpenAI, 2022). ChatGPT is an artificial intelligence-based chatbot capable of having human-like conversations. Users can ask questions or make requests, and the system will respond directly.

ChatGPT has shown potential in enhancing learning activities, especially in education. Research found that integrating ChatGPT into classroom settings increased student engagement and participation, leading to improved learning outcomes. ChatGPT has been used in a variety of ways, such as providing quick access to information, answering questions, providing explanations, and simulating patient interactions (Leunard et al., 2023)

Recent research in the field of English language learning has highlighted the positive influence of ChatGPT integration on learner motivation, with a particular focus on improving reading and writing skills (Garkusha & Gorodova, 2023). The integration of ChatGPT as a learning tool has been shown to create an engaging and interactive learning environment, which in turn stimulates learners' motivation to actively participate in the language learning process.

ChatGPT is emerging as a formidable assistant in the world of education, ready to provide invaluable help and support to students. Its potential lies in its ability to fulfil a wide range of student needs. For example, students can utilise the power of ChatGPT as a tool to seek answers to their questions regarding learning materials, decipher complicated concepts that may pose a challenge, or get advice and recommendations regarding their assignments or projects (Xie et al., 2019).

In addition to its role in improving learning outcomes, ChatGPT has emerged as a powerful tool for increasing student engagement in the learning process (Vicky et al., 2023). By utilising its interactive capabilities, ChatGPT can present dynamic and stimulating learning content that goes beyond traditional teaching methods.

To maximise the effective use of ChatGPT in educational settings, it is crucial to involve both teachers and technology developers (Kato et al., 2020). Teachers play a central role in integrating technology into their teaching practices. They have pedagogical expertise and a deep understanding of students' learning needs.

ChatGPT can have a variety of impacts on education, including helping to find materials, enabling independent learning, facilitating language learning, promoting creativity, enabling coding, acting as a planner, providing a variety of information, and supporting teachers. ChatGPT can provide quick access to information, answer questions, provide explanations, provide case scenarios, and give personalised feedback (Barman et al., 2023).

ChatGPT has been shown to empower students by encouraging autonomy and ownership in learning, adapting to individual learning styles. The integration of ChatGPT into the educational process allows students to explore resources, generate ideas and create personalised content, leading to deeper engagement with learning materials (Alneyadi & Wardat, 2023).

ChatGPT has been shown to have a positive impact on academic performance, assisting students in understanding difficult concepts and providing relevant study materials. Its ability to generate explanations and clarify complex topics in a user-friendly manner has been shown to improve students' understanding and retention of information, ultimately leading to improved academic performance (Jowarder, 2023).

In the context of English language learning, ChatGPT offers various functionalities that contribute to learning. The auto-grading feature for tests and assignments streamlines the assessment process, providing timely feedback to students and helping them identify areas that need improvement to enhance their language skills. ChatGPT's customisation capabilities allow for a

personalised learning experience, catering to the unique needs, preferences and learning pace of each student

METHODOLOGY

This study employs a descriptive quantitative methodology to investigate students' perspectives on using ChatGPT for English language learning at Universitas Negeri Yogyakarta. Descriptive research aims to gather thoughts or perceptions from a specific demographic (Creswell, 2012:134). The research was carried out at Universitas Negeri Yogyakarta, located in Sleman, Daerah Istimewa Yogyakarta, Indonesia. The research setting was chosen intentionally due to the researcher's firsthand experience as a student at the institution.

The population comprises all master's students in the English Education Department during the 2022/2023 academic year, totaling 215 students across seven classes. Using purposive sampling, 43 students (20% of the population) were selected as the sample, considering factors such as skills, availability, and cost implications (Sugiyono, 2009).

The variables investigated in this study are operationally limited to students attitude, perception, advantage, and disadvantage. Examining variables associated with how students attitude and perception toward the benefits and drawbacks of ChatGPT offers important information about their acceptance or resistance to using it in English language learning activities.

Data collection utilizes a questionnaire adapted from Liu (2023), consisting of 16 statements divided into four categories: perceptions of ChatGPT, attitudes toward ChatGPT practice, perceived advantages, and perceived disadvantages. Responses are measured on a 5-point Likert scale. The questionnaire's validity and reliability were verified, with a Cronbach's Alpha reliability of 0.99.

Data analysis employs descriptive statistics, including mean scores, standard deviation, and variance (Sugiyono, 2017). Results are categorized using ideal assessment categories developed by Azwar (2010), ranging from "Very Good" to "Very Less."

The research procedure began with an initial observation to identify a relevant research problem, followed by the development of a research proposal that outlined the study's objectives and methodology. After this, the appropriate instruments for data collection were chosen and adjusted to fit the research context. The survey was then conducted, gathering data from the target population. This data was collected and subjected to processing and analysis to extract meaningful insights. Finally, the entire research process and its findings were compiled into a comprehensive research report.

This methodology allows for a systematic gathering of data to provide a comprehensive picture of students' perspectives on ChatGPT use in English language acquisition. It enables the exploration of specific phenomena experienced by study participants, offering insights into the integration of AI technology in teaching and learning (Moleong, 2017).

RESULT

This study aimed to investigate the perspectives of Yogyakarta University students on using ChatGPT for English learning, including their opinions on its advantages and disadvantages. The results are based on survey responses from the participants.

Perceptions and Understanding of ChatGPT

According to Azwar (2010)'s rating intervals, Table 1's descriptive analysis reveals that most students have favorable opinions and comprehension of ChatGPT.

Table 1. Presents the Descriptive Analysis of Participants' Perceptions and Understanding of ChaGPT

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Mean	SD
I find using ChatGPT to be simple and convenient.	41.67%	47.92%	8.33%	0.00%	2.08%	4.27	0.79
I believe ChatGPT can help me learn more effectively.	33.33%	50.00%	10.42%	2.08%	4.17%	4.06	0.95
Learning with ChatGPT is enjoyable.	31.25%	50.00%	14.58%	4.17%	0.00%	4.08	0.79
I feel that I can easily understand the content provided by ChatGPT.	16.67%	54.17%	22.92%	0.00%	6.25%	3.75	0.96
I am willing to invest time and effort to better utilize ChatGPT for learning.	20.83%	43.75%	20.83%	12.50%	2.08%	3.69	1.01
I expect to use ChatGPT frequently for learning in	20.83%	39.58%	27.08%	10.42%	2.08%	3.67	1.00

the future.							

The majority of participants (89.59%) found ChatGPT simple and convenient to use, with a high mean score of 4.27. Most students (83.33%) believed ChatGPT could help them learn more effectively, and 81.25% found learning with ChatGPT enjoyable. A significant portion (70.84%) felt they could easily understand the content provided by ChatGPT. While 64.58% of participants were willing to invest time and effort to better utilize ChatGPT for learning, there was more diversity in responses to this statement, as indicated by the highest standard deviation (1.01). Regarding future use, 60.41% expected to use ChatGPT frequently for learning, but a notable 27.08% remained neutral on this point.

Attitudes Towards Actual Practice in Using ChatGPT

Table 2. Illustrates Students' Attitudes Towards Actual Practice in Using ChatGPT

Statement	**Strongly Agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**	**Mean**	**SD**
I use ChatGPT to increase my interest and motivation in learning English.	22.92%	29.17 %	31.25%	14.58%	2.08%	3.56	1.07
I use ChatGPT to improve my English communication skills (listening/speaking).	12.50%	16.67 %	35.42%	20.83%	14.58%	2.92	1.22
I use ChatGPT to improve my English reading and writing abilities (e.g. proofreading).	22.92%	41.67 %	14.58%	10.42%	10.42%	3.56	1.25
I use ChatGPT to help me again a deeper understanding of the English	16.67%	41.67 %	27.08%	8.33%	6.25%	3.54	1.07

language and culture.							

About half of the participants (52.09%) used ChatGPT to increase their interest and motivation in learning English. However, opinions were mixed regarding its use for improving English communication skills, with only 29.17% agreeing or strongly agreeing, and 35.41% disagreeing or strongly disagreeing. A majority (64.59%) used ChatGPT to improve their English reading and writing abilities, such as for proofreading. Additionally, 58.34% used it to gain a deeper understanding of English language and culture.

Perceptions of ChatGPT's Advantages

Table 3. Presents Data on Students' Perceptions of ChatGPT's Advantages

Statement	**Strongly Agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**	**Mean**	**SD**
I think ChatGPT can help me improve the quality of my learning.	18.75%	52.08%	18.75%	8.33%	2.08%	3.77	0.93
I believe ChatGPT can provide me with more learning opportunities.	22.92%	45.83%	18.75%	8.33%	4.17%	3.75	1.04
I think ChatGPT can help me enhance my learning abilities.	22.92%	43.75%	20.83%	12.50%	0.00%	3.77	0.95

A significant majority of participants (70.83%) believed that ChatGPT could help improve the quality of their learning. Similarly, 68.75% thought ChatGPT provided more learning opportunities, and 66.67% believed it could enhance their learning abilities.

Perceptions of ChatGPT's Disadvantages

Table 4. Shows Participants' Responses Regarding the Disadvantages of ChatGPT

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Mean	SD
I think ChatGPT may have issues with plagiarism or information leakage.	29.17%	41.67%	16.67%	6.25%	6.25%	3.81	1.12
I think ChatGPT's responses may contain some inaccurate information.	16.67%	41.67%	29.17%	10.42%	2.08%	3.60	0.96
I think ChatGPT is not helpful for my English learning.	4.17%	20.83%	14.58%	35.42%	25.00%	2.44	1.20

A large majority (70.84%) expressed concerns about potential issues with plagiarism or information leakage when using ChatGPT. Additionally, 58.34% thought ChatGPT's responses might contain inaccurate information. However, most participants (60.42%) disagreed with the statement that ChatGPT is not helpful for English learning, indicating that they generally found it useful despite these concerns.

Profile of Attitudes and Perceptions

The study also analyzed the overall level of attitudes and perceptions about the use of ChatGPT in English learning based on average score categories.

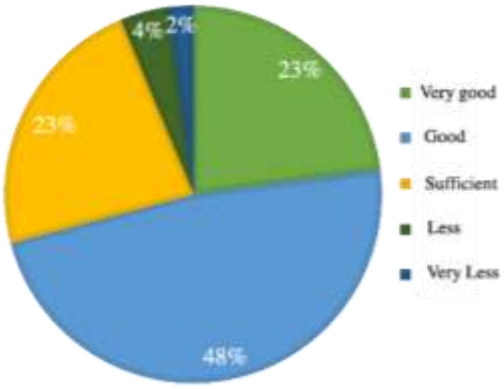

Figure 1. Average Score of Attitude and Perception about the Use of ChatGPT

Figure 1 Shows That The Majority of Participants (48%) Had A "Good" Attitude and Perception towards Using ChatGPT for English Learning. 11% Fell Into The "Very Good" Category, and Another 11% Were in The "Sufficient" Category.

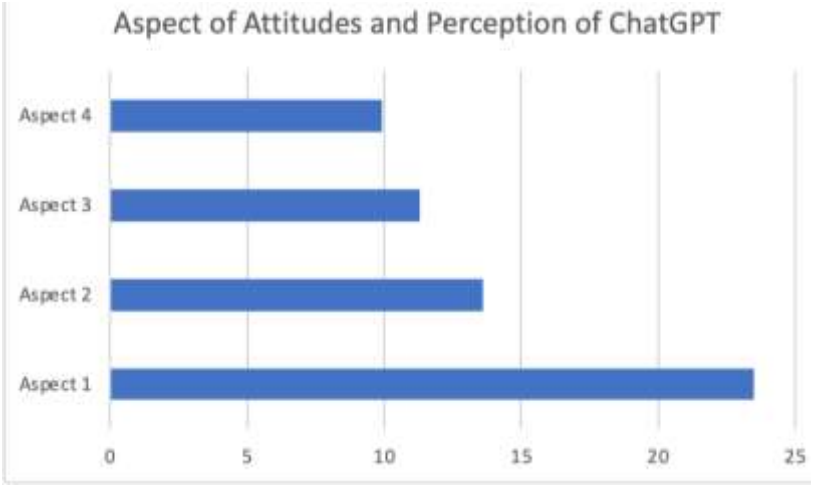

Figure 2. Average Score of Aspects of Attitude and Perception about the Use of ChatGPT

Figure 2 breaks down the average scores for different aspects of attitudes and perceptions about ChatGPT use. The highest-scoring aspect was "Perceptions or understanding of ChatGPT" (23.5), followed by "Attitudes toward real ChatGPT practice" (13.6). The "ChatGPT downsides" aspect had the lowest average score, falling in the "sufficient" category.

DISCUSSION

The results of this study reveal generally positive attitudes towards ChatGPT among Yogyakarta University students for English learning purposes. Most students find ChatGPT easy to use and believe it can enhance their learning experience and outcomes. This aligns with previous research highlighting the potential benefits of AI-powered language learning tools (Chapelle, C. A., & Sauro, S., 2017).

However, the findings also indicate some areas of concern. While students appreciate ChatGPT for reading, writing, and cultural understanding, they are less confident in its ability to improve communication skills, particularly listening

and speaking. This suggests that ChatGPT may be more effective as a complementary tool rather than a comprehensive solution for all aspects of language learning (Berns, A., et al., 2013)

The high level of concern regarding potential plagiarism and information accuracy issues is noteworthy. This underscores the importance of developing critical thinking skills and teaching students how to use AI tools responsibly in academic contexts (Eaton, S. E., 2021).. Educators may need to provide guidance on verifying information and using ChatGPT as a learning aid rather than a substitute for original work.

Despite these concerns, the overall positive perception of ChatGPT's impact on learning quality and opportunities is encouraging. It suggests that, with proper integration and guidance, ChatGPT could be a valuable asset in English language education (Kukulska-Hulme, A., & Viberg, O., 2018)

The varied responses regarding future use and willingness to invest time in learning to use ChatGPT more effectively indicate that there may be a need for more structured introduction and training on how to leverage this tool in language learning contexts (Hubbard, P., 2013)

In conclusion, while Yogyakarta University students generally view ChatGPT as a beneficial tool for English learning, there are important considerations regarding its limitations and potential drawbacks. Future research could explore effective strategies for integrating ChatGPT into language curricula while addressing concerns about accuracy, plagiarism, and balanced skill development.

CONCLUSION AND RECOMENDATION

Conclusions

This study on Yogyakarta University students' perspectives on using ChatGPT for English learning reveals a generally positive attitude towards this AI-powered tool. The majority of students find ChatGPT easy to use, enjoyable, and beneficial for their learning process. They particularly appreciate its utility in improving reading and writing skills, as well as enhancing their understanding of English language and culture. However, the research also highlights several important concerns. Students are less confident in ChatGPT's ability to improve communication skills, particularly in listening and speaking. There are also significant worries about potential issues with plagiarism, information leakage, and the accuracy of information provided by ChatGPT. Despite these concerns, most students still consider ChatGPT helpful for their English learning journey. The varied responses regarding future use and willingness to invest time in mastering ChatGPT suggest that while students see its potential, they may need more guidance and structure to fully leverage this tool in their language learning process.

Recommendations

1. Integration into curriculum: Educational institutions should consider integrating ChatGPT and similar AI tools into their English language curriculum in a structured manner, focusing on areas where students find it most beneficial, such as reading and writing.

2. Training programs: Develop comprehensive training programs for both students and educators on how to effectively use ChatGPT for language learning, addressing its strengths and limitations.
3. Ethical guidelines: Establish clear guidelines on the ethical use of AI in academic contexts, particularly addressing concerns about plagiarism and information accuracy.
4. Balanced approach: Encourage a balanced approach to language learning, using ChatGPT as a complementary tool alongside traditional methods, especially for developing speaking and listening skills.
5. Critical thinking skills: Emphasize the development of critical thinking skills to help students evaluate and verify information provided by AI tools.
6. Regular assessment: Conduct regular assessments of the impact of ChatGPT on students' language learning outcomes to ensure its continued effectiveness and relevance.

FURTHER STUDY

1. Long-term impact: Conduct longitudinal studies to assess the long-term impact of ChatGPT use on English language proficiency across all skills (reading, writing, listening, and speaking).
2. Comparative analysis: Compare the effectiveness of ChatGPT with other AI-powered language learning tools and traditional methods to identify the most beneficial approaches for different aspects of language learning.
3. Pedagogical strategies: Investigate effective pedagogical strategies for incorporating ChatGPT into various English language teaching contexts, including classroom settings, self-study, and blended learning environments.
4. Ethical considerations: Explore in-depth the ethical implications of using AI in language education, including issues of data privacy, intellectual property, and the potential for AI dependency.
5. Skill-specific research: Conduct focused studies on how ChatGPT can be optimized to improve specific language skills, particularly those where students reported less confidence (e.g., speaking and listening).
6. Cultural and linguistic diversity: Examine how ChatGPT performs in supporting English learners from diverse cultural and linguistic backgrounds, and identify any biases or limitations in this regard.
7. Teacher perspectives: Investigate educators' views on integrating ChatGPT into their teaching practices, including perceived benefits, challenges, and professional development needs.
8. Cognitive load: Study the impact of ChatGPT use on students' cognitive load during the language learning process and its implications for learning efficiency and retention.
9. Adaptive learning: Explore the potential for developing adaptive learning systems that incorporate ChatGPT, tailoring the learning experience to individual student needs and progress.
10. Cross-cultural communication: Investigate how ChatGPT can be used to enhance cross-cultural communication skills and intercultural competence in English language learners.

REFERENCES

Alneyadi, S., & Wardat, Y. (2023). ChatGPT: Revolutionizing student achievement in the electronic magnetism unit for eleventh-grade students in Emirates schools. Contemporary Educational Technology, 15(4). https://doi.org/10.30935/cedtech/13417

Azaria, Amos. . (2022). ChatGPT Usage and Limitations. DOI:10.13140/RG.2.2.26616.11526

Azwar, S. (2010). Research methods. Pustaka Pelajar

Barman, H., saikia, bishwajeet, & Jamil, M. (2023). How Can ChatGPT Be Helpful In Undergraduate Medical Education: We Had A Chat! (Preprint). JMIR Medical Education. https://doi.org/10.2196/47853

Berns, A., Gonzalez-Pardo, A., & Camacho, D. (2013). Game-like language learning in 3-D virtual environments. Computers & Education, 60(1), 210-220.

Bostrom, N. (2017). Superintelligence. Paths, dangers, strategies. Reprint with corrections. Oxford: Oxford University Press.

Chan, C.K.Y. & Hu, W.(2023). Students' voices on generative AI: perceptions, benefits, and challenges in higher education. Int J Educ Technol High Educ 20, 43. https://doi.org/10.1186/s41239-023-00411-8.

Chapelle, C. A., & Sauro, S. (Eds.). (2017). The Handbook of Technology and Second Language Teaching and Learning. John Wiley & Sons.

Chowdhury S. 2003. Organization 21 C: Someday All Organizations Will Lead This Way. Financial Times-Prentice Hall.

Cooper, K. (2021). OpenAI GPT-3: Everything you need to know. Springboard, https://www.springboard.com/blog/data-science/machine-learning-gpt-3-open-ai/. Accessed on February 10, 2024, at 9:33 AM

Creswell, J. (2012). Educational Research (4th Edition). Pearson

Dharani, M., Jyostna, J. V. S. L., Sucharitha, E., Likitha, R., & Manne, S. (2020). Interactive Transport Enquiry with AI Chatbot. 2020 4th International Conference on Intelligent Computing and Control Systems (ICICCS), 1271–1276. https://doi.org/10.1109/ICICCS48265.2020.9120905

Eaton, S. E. (2021). Plagiarism in the age of artificial intelligence: Preventing misconduct and encouraging academic integrity in higher education. International Journal for Educational Integrity, 17(1), 1-17.

Fitria, T. N. (2021). Artificial Intelligence (AI) In Education: Using AI Tools for Teaching and Learning Process. Prosiding Seminar Nasional & Call for Paper STIE AAS, 4(1), 134–147. https://prosiding.stie-aas.ac.id/index.php/prosenas/article/view/106

Garkusha, N. S., & Gorodova, J. S. (2023). Pedagogical opportunities of ChatGPT for developing cognitive activity of students. Vocational

Education and Labour Market, 11(1), 6–23. https://doi.org/10.52944/PORT.2023.52.1.001

Grace, K., Salvatier, J., Dafoe, A., Zhang, B., & Evans, O. (2018). Viewpoint: When will AI exceed human performance? Evidence from AI experts. Journal of Artificial Intelligence Research, 729–754.

Hao, K. (2022). Everything to know about Elon Musk's OpenAI, the maker of ChatGPT. Augustman, https://www.augustman.com/sg/gear/tech/openai-what-to-knowabout-the-company-behind-chatgpt/. Accessed on March 9, at 6:51 AM.

Harari, Y. N. (2016). Homo deus. A brief history of tomorrow. London: Harvill Secker.

Harris, L. R., & Brown, G. T. (2019). Mixing interview and questionnaire methods: Practical problems in aligning data. Practical Assessment, Research, and Evaluation, 15(1), 1.

https://www.semanticscholar.org/paper/A-Review-on-Implementation-Issues-of-Rule-based-Thorat-Jadhav/d0e33e0de8ee5f9f0ef99f529adf2ae85ae0d246

Hubbard, P. (2013). Making a case for learner training in technology enhanced language learning environments. CALICO Journal, 30(2), 163-178.

Jin, B., & Kruppa, M. (2023). Cheating with ChatGPT: Can an AI chatbot pass AP Lit? The Wall Street Journal, https://www.wsj.com/articles/chatgpt-creatoropenai-is-in-talks-for-tender-offer-that-would-value-it-at29-billion-11672949279. Accessed on March 9, 2024, at 6:45 AM

Jowarder, M. I. (2023). The Influence of ChatGPT on Social Science Students: Insights Drawn from Undergraduate Students in the United States. Indonesian Journal of Innovation and Applied Sciences (IJIAS), 3(2), 194–200. https://doi.org/10.47540/ijias.v3i2.878

Kasneci, E., Seßler, K., Küchemann, S., Bannert, M., Dementieva, D., Fischer, F., ... & Kasneci, G. (2023). ChatGPT for good? On opportunities and challenges of large language models for education. Learning and individual differences, 103, 102274.https://doi.org/10.1016/j.lindif.2023.102274.

Kato, N., Mao, B., Tang, F., Kawamoto, Y., & Liu, J. (2020). Ten Challenges in Advancing Machine Learning Technologies toward 6G. IEEE Wireless Communications, 27(3), 96–103. https://doi.org/10.1109/MWC.001.1900476

Kirk R.E., & Othmer, D.F., (1997). Encyclopedia of Chemical Technology. 23, 4nd edition, John Wiley & Sons Inc.,New York

Kukulska-Hulme. (2012). How should the higher education workforce adapt to advancements in technology for teaching and learning?. The Internet and Higher Education, 15(4), pp. 247-254.

Kurzweil, R. (2005). The singularity is near. New York City: Viking Penguin

Leunard, H., Rachmawati, R., Zani, B. N., & Maharjan, K. (2023). GPT Chat: Opportunities and Challenges in the Learning Process of Arabic Language in Higher Education. Journal International of Lingua and Technology, 2(1), 10–22. https://doi.org/10.55849/jiltech.v2i1.439

Liu, Y., Han, T., Ma, S., Zhang, J., Yang, Y., Tian, J., He, H., Li, A., He, M., Liu, Z., Wu, Z., Zhu, D., Li, X., Qiang, N., Shen, D., Liu, T., & Ge, B. (2023). Summary of ChatGPT/GPT-4 Research and Perspective Towards the Future of Large Language Models. ArXiv, abs/2304.01852. https://doi.org/10.48550/arXiv.2304.01852

Lo, Leo S. (2023). The CLEAR Path: A Framework for Enhancing Information Literacy Through Prompt Engineering. The Journal of Academic Librarianship 49 (4): 1-3. https://doi.org/10.1016/j.acalib.2023.102720.

McAfee, A., & Brynjolfsson, E. (2017). Machine platform crowd. Harnessing our digital future. New York City: W. W. Norton & Company.

Mhlanga, David. (2023). Open AI in Education, the Responsible and Ethical Use of ChatGPT Towards Lifelong Learning. https://ssrn.com/abstract=4354422.

Moleong, L. . (2017). Metodologi Penelitian Kualitatif. PT. Remaja Rosdakarya.

OpenAI. (2015). Introducing OpenAI. https://openai.com/blog/introducing-openai/. Accessed on March 3, 2024, at 7:58 AM

OpenAI. (2022). ChatGTP: Optimizing language models for dialogue. https://openai.com/blog/ chatgpt/. Accessed on March 9, 2024, at 7:12 AM

Rudolph, J., Samson Tan & Shannon Tan. (2023). ChatGPT: Bullshit spewer or the end of traditional assessments in higher education?. Journal of Applied Learning & Teaching, 6(1) 2023. http://journals.sfu.ca/jalt/index.php/jalt/index. Accessed on March 9, 2024, at 8:23 AM

Sallam, M. (2023). ChatGPT utility in healthcare education, research, and practice: Systematicreview on the promising perspectives and valid concerns. Healthcare, 11(6), 1–20. https://doi.org/10.3390/healthcare11060887.

Searle, J. (1980). Minds, brains and programs. Behavioral and Brain Sciences, 3(3), 417–457. doi:10.1017/S0140525X00005756.

Sugiyono. (2009). Metode Penelitian Kuantitatif Kualitatif dan R&D. Bandung: Alfabeta

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

Thorat, S., & Jadhav, V. (2020). A Review on Implementation Issues of Rule-based Chatbot Systems. Social Science Research Network.

Vicky, D., Adrianna, H., & Phan, B. (2023). Use of Gadgets by Early Childhood in the Digital Age to Increase Learning Interest. Scientechno: Journal of Science and Technology, 2(1), 17–34. https://doi.org/10.55849/scientechno.v2i1.58

Xie, H., Chu, H.-C., Hwang, G.-J., & Wang, C.-C. (2019). Trends and development in technology-enhanced adaptive/personalized learning: A systematic review of journal publications from 2007 to 2017. Computers & Education, 140, 103599. https://doi.org/https://doi.org/10.1016/j.compedu.2019.103599

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). https://doi.org/10.1186/s41239-019-0171-0

Zhang, K., & Aslan, A. B. (2021). AI technologies for education: Recent research & future directions. Computers and Education: Artificial Intelligence, 2, 100025.