

The Effectiveness of ChatGPT Usage in Enhancing Students' Vocabulary Mastery

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Abstract

This study investigates the effectiveness of using ChatGPT, an AI-based chatbot developed by OpenAI, in enhancing students' English vocabulary mastery at SMP Negeri 12 Bolaang Mongondow Utara. The research employed a quantitative approach with a pre-experimental design, specifically a one-group pre-test and post-test. Twenty-four eighth-grade students participated in the study. The instrument used 30 number of multiple-choices vocabulary test, focused on nouns, verbs, and adjectives. After six meetings integrating ChatGPT with narrative text materials, data was analyzed using the Wilcoxon Signed Rank Test with Z Value was -4.288 with Asymp. Sig. (2-tailed) < 0.001. Because the p value < 0.05, the null hypothesis (H_0) was rejected, and it can be concluded that there is a significant difference between the pre-test and post-test results. This indicates that ChatGPT significantly enhanced students' vocabulary mastery. The findings suggest that integrating AI in English learning can provide engaging, interactive, personalized and effective support for vocabulary acquisition.

Keywords: ChatGPT, Vocabulary Mastery, Narrative Text

Abstrak

Penelitian ini menyelidiki efektivitas penggunaan ChatGPT, sebuah chatbot berbasis AI yang dikembangkan oleh OpenAI, dalam meningkatkan penguasaan kosakata bahasa Inggris siswa di SMP Negeri 12 Bolaang Mongondow Utara. Penelitian ini menggunakan pendekatan kuantitatif dengan desain pra-eksperimental, khususnya tes awal dan tes akhir satu kelompok. Dua puluh empat siswa kelas delapan berpartisipasi dalam penelitian ini. Instrumen yang digunakan adalah 30 soal tes kosakata pilihan ganda, yang berfokus pada kata benda, kata kerja, dan kata sifat. Setelah enam pertemuan mengintegrasikan ChatGPT dengan materi teks naratif, data dianalisis menggunakan Uji Peringkat Bertanda Wilcoxon dengan Nilai Z sebesar -4,288 dengan Asymp. Mr. (2-tailed) < 0,001. Karena nilai $p < 0,05$, hipotesis nol (H_0) ditolak, dan dapat disimpulkan bahwa terdapat perbedaan yang signifikan antara hasil tes awal dan tes akhir. Hal ini menunjukkan bahwa ChatGPT secara signifikan meningkatkan penguasaan kosakata siswa. Temuan ini menunjukkan bahwa mengintegrasikan AI dalam pembelajaran bahasa Inggris dapat memberikan dukungan yang menarik, interaktif, personal, dan efektif untuk pemerolehan kosakata.

Kata Kunci: ChatGPT, Penguasaan Kosakata, Teks Naratif

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INTRODUCTION

The world has entered the era of Society 5.0, an era where technologies such as artificial intelligence, the Internet of Things, and big data are used to improve the quality of human life and solve social problems. In other words, in the era of society 5.0, many things can be integrated with technology so as to maximize human activities more quickly and efficiently. Tavares et al (2022), also assert that era 5.0 is a true revolution of society and humanity focused on quality of life, human, social, environmental, and economic well-being. On the otherhand After experiencing accelerated technological development during the Industrial Revolution 4.0, which had an impact on all sectors, the education sector is no exception. Currently, the Indonesian government has made artificial intelligence as one of the national strategic programs to achieve the vision of Indonesia Emas 2045 and has made education and research as one of the top priorities.

The potential of AI has been widely recognized by many experts, who emphasize its ability to provide engaging support for students and offer appropriate feedback. Artificial intelligence (AI)

technologies present novel tools and applications with the capacity to revolutionize conventional approaches to teaching and learning. Within the realm of education, AI holds diverse prospects, such as enhancing efficiency, educational outcomes, tailored teaching, immediate response mechanisms, and fostering student involvement (Adiguzel et al., 2023). Several examples of the use of Artificial Intelligence in teaching, especially English, have been carried out, one of which is during the pandemic, many schools implemented Work from Home (WFH) so that English teachers used AI applications in implementing the Project-based learning method in English learning and the results were quite positive, students were more motivated because many AI applications could help students in conducting mini research and data collection.

In addition, the presence of AI applications such as Grammarly has also been utilized by teachers in increasing the level of students' writing skills and much more. A study conducted by Yakob et al (2023), by collecting data from previous studies regarding the perspectives and experiences of teachers and students in using artificial intelligence in English lessons, obtained positive results where students considered the presence of artificial intelligence to be beneficial in improving learning experiences and English skills. According to published scientific literature, AI technology holds promise as a valuable asset in education, fulfilling diverse roles that enhance learning and pedagogical experiences (Grassini, 2023).

In learning English, students at school are required to master the four basic skills: reading, speaking, writing, and listening. These fundamental abilities are inseparable from the significant role of vocabulary. A student with a limited vocabulary will not perform effectively in all aspects of language (Susanto, n.d.2017). However, in reality, many students experience obstacles when taking English lessons in class due to various factors. A study conducted by Mawardiyah (2023), revealed that there are three basic roles in learning English, namely pronunciation, vocabulary, and grammar. These three abilities are also influenced by internal and external factors such as physiological, psychological, social and non-social environmental factors. On the other hand, research conducted by Sucandra et al (2022), trying to analysed students' difficulties in mastering vocabulary in English lessons also revealed that many factors are responsible for students' success in learning vocabulary such as teaching variations, the use of learning media and student learning motivation. Researchers strongly agree that some of the factors mentioned earlier are very important in influencing student success in vocabulary mastery. Especially in SMP N 12 Bolaang Mongondow Utara, the researcher has observed the students' English learning process during the PMS (Program Mengajar Disekolah) and found that many students feel bored with monotonous traditional methods such as memorizing vocabulary which ultimately affects the results and motivation of the students themselves. Therefore, the researcher wants to introduce ChatGPT as a new media that is expected to be the first step to increase the effectiveness and optimization of English learning, especially vocabulary mastery.

Based on the earlier findings, this study aimed to investigate the effectiveness of using AI products, especially ChatGPT, in English language learning at school. ChatGPT is one of the latest artificial intelligence products. However, there is still a lack of in-depth research on the effectiveness of ChatGPT in assisting English language acquisition, especially in students' vocabulary. On the other hand, this research also offers a new and different approach to integrating AI technology into the learning system in schools by using narrative text material in the English for Nusantara book. This research also answers the challenges of teaching English in the digital era. The main focus of this research is to determine the effectiveness of ChatGPT on students' vocabulary acquisition, of course, the researcher hopes that this research will provide new insights in the field of English education with the integration of artificial intelligence technology. The research questions were served as guiding principles for this study, exploring various aspects of this topic.

LITERATURE REVIEW

The Definition of Artificial Intelligence

John McCarthy, an American computer scientist, pioneered the science of artificial intelligence. McCarthy was a pioneer in the field of artificial intelligence, coining the term in 1955. The phrase "artificial intelligence" was first defined by John McCarthy, as follows: AI aims to create machines with human-like intelligence. (Ertel, 2017) AI, sometimes known as machine intelligence, is a discipline of computer science that aims to construct intelligent robots that mimic human behaviour, as opposed to

the natural intelligence demonstrated by people. Tristian K & Automation (2023) also emphasized that recent developments in machine learning and sensors have led to a new generation of robots.

According to B. Jack (1998) in Britannica.com, Artificial intelligence (AI), the ability of a digital computer or computer-controlled robot to perform tasks commonly associated with intelligent beings. The term is frequently applied to the project of developing systems endowed with the intellectual processes characteristic of humans, such as the ability to reason, discover meaning, generalize, or learn from past experience.

Artificial Intelligent in education

The presence of artificial intelligence has marked a new era of technological advancement in which artificial intelligence (AI) has changed various aspects of human life, including in the field of education. In this case, artificial Intelligence technology can be explored more fully, in building relevant education in the future with its ability to collect, analyse and process massive data very quickly, providing great potential for more relevant education.

Karyadi (2023), asserts that with the existence of artificial intelligence technology and its benefits, learners can have a learning experience that is more adaptive, personalized, and focused on individual needs to improve both their abilities and intelligence. In addition, the application of artificial intelligence in the education environment can also be used to analyse big data, enabling teachers to harness the potential of abundant student learning data to improve the education curriculum. By collecting, storing, and analysing such data, we can identify relevant patterns and trends to understand the strengths and weaknesses of the current curriculum.

ChatGPT in English Learning

According to Hatmanto (2023), With its extensive knowledge base and ability to generate context-appropriate responses, ChatGPT has the potential to revolutionize the way English education is delivered and experienced. As a teacher, striving to create a more engaging and personalized learning experience is one of the obligations of a teacher, therefore, ChatGPT offers an exciting opportunity to explore new possibilities in language learning and teaching. By utilizing its conversational capabilities, learners can engage in interactive dialogues that simulate real-life language use, allowing them to practice and strengthen their language skills dynamically and deeply. A study conducted by Amin (2023) revealed that the integration of AI and ChatGPT into EFL language teaching has the potential to revolutionize the field, offering many benefits to both educators and learners. Through personalized learning experiences, real-time language practice, and assistance in lesson planning, AI and ChatGPT empower teachers to meet individual student needs and improve classroom support.

Definition of Vocabulary

According to Lehr et al. (2004. p. 5) Vocabulary is the knowledge of words and their meanings. However, vocabulary is more sophisticated than this definition implies. First, there are two types of words: oral and printed. Oral vocabulary refers to the words we identify and use while listening and speaking. Print vocabulary refers to the words we identify and use while reading and writing. Second, word knowledge exists in two forms: receptive and productive.

Richard & Renandya (2002. p. 255) Assert that Vocabulary is an essential component of language ability, forming the foundation for how well students talk, listen, read, and write. Learners who lack a broad vocabulary and strategies for expanding their vocabulary frequently underachieve and may be discouraged from taking advantage of language learning opportunities such as listening to the radio, speaking with native speakers, using the language in different contexts, reading, or watching television.

Types of Vocabulary

Shephend (1987) as cited Hastuti (2011, p. 194) Classify vocabulary into two types: receptive vocabulary and expressive vocabulary. When students hear ideas from others, receptive vocabulary replaces the terms they already know. This vocabulary is a basic vocabulary and a repository of words that students can use to comprehend the sentiments of others when they listen and read, as well as to explain their feelings when they talk and write. Students' expressive vocabulary includes the words they use when speaking, writing, or expressing their thoughts. This vocabulary can be utilized once they have learned receptive vocabulary. For example, they can read stories or learn new terms, then talk about them or express their opinions, allowing them to utilize the new words again while speaking or writing.

Elfrieda H. Hiebert & Michael L. Kamil (2005, p. 3) assert that. In general, vocabulary refers to knowledge of the meanings of words. This definition is complicated by the fact that words can be spoken or printed. Word knowledge is divided into two categories: receptive vocabulary, which we can understand or recognize, and productive vocabulary, which we utilize when we write or talk. Oral vocabulary refers to the words we use and understand when speaking or reading. Print vocabulary refers to words that may be used in writing or speaking, while productive vocabulary refers to a person's ability to employ specific words. They are terms that are widely recognized, familiar, and regularly used. Receptive vocabulary refers to the ability to attach meanings to words while listening or reading. Silent writing or reading allows for comprehension of meaning.

Part of Speech

Part of speech, or word classes, are basic elements in language that help shape the structure and meaning of sentences. According to Murphy (2002), part of speech is a category of words that has a specific function in the sentence, such as noun, verb, adjective and others. Each of these categories has a different role in shaping the structure and meaning of the sentence.

The Effectiveness of ChatGPT in Vocabulary learning

A study conducted by Shaikh et al (2023), assessed that ChatGPT is very useful in formal English learning tasks, including vocabulary. The results of this study also reported that students had a positive experience and improvement in their language skills after using ChatGPT for interactive and conversational exercises. In addition, another study conducted by Huang et al (2022), in its review of chatbot-supported language learning found that chatbots are very useful in the context of language learning and also highlighted that chatbots can provide interactive and repetitive exercises that support vocabulary acquisition. Therefore, ChatGPT can be a very promising tool in the process of learning English, especially vocabulary mastery, with a variety of advanced features offered by this artificial intelligence product is expected to be one of the effective learning alternatives for students to learn English, especially vocabulary mastery.

Teaching English Vocabulary Using ChatGPT

Teachers have a variety of tasks and responsibilities for the success of students in learning, especially English lessons, teachers are required to be more creative and varied in the teaching process. (Monawati & Fauzi, 2018) in their research concluded that student learning achievement is strongly influenced by the creativity of a teacher such as in choosing teaching methods, teaching media, quality and being careful in seeing the potential of children in the school environment. ChatGPT can be used for a variety of tasks, such as providing interactive conversation exercises that help students practice the use of vocabulary in real contexts, as well as providing corrections and explanations of grammatical errors made by students. In addition, ChatGPT can assist students in writing essays or paragraphs by providing immediate feedback that can improve vocabulary usage and sentence structure. With the ability to provide explanations of the cultural context of English and dialectal variations, ChatGPT also enriches students' understanding of the appropriate use of vocabulary in various situations.

METHODS

The design of this research is Quantitative method. To explore the effectiveness of using ChatGPT for students at SMP Negeri 12 Bolaang Mongondow Utara used, the researcher used pre-experimental technique. According to Creswell (2009) Quantitative research is a means for testing objective theories by examining the relationship among variables. These variables, in turn, can be measured, typically on instruments, so that numbered data can be analysed using statistical procedures. Musianto (2002) as cited Tobing & Erlangga (2023) also asserts that quantitative research is research that uses measurements, calculations, formulas, and the certainty of numerical data in planning, processes, building hypotheses, techniques, analyzing data, and drawing conclusions. This research uses a deductive approach that aims to test the hypothesis. Meanwhile, the pre-experimental technique that used is One group Pretest – posttest. With this design, where one group of subjects or participants was given certain treatments or interventions. Rare initially by giving an initial test (pretest) to the subject then given treatment for a certain period of time and then conducting a test again after the treatment (posttest) is carried out. This research design is used to test the effectiveness of a particular intervention or treatment on a group of subjects. By using this design, researchers can see changes before and after the use of artificial intelligence, especially chat GPT in improving students' vocabulary mastery skills.

Imron (2019) as cited Sabtohadhi J et al. (2022) Population is a generalization area consisting of objects or subjects that have certain qualities and characteristics set by researchers to study and then draw conclusions. Based on this statement, the population in this study were all students of SMP N 12 Bolaang Mongondow Utara. With a total of 59 students divided into three study rooms namely class VII, VIII, and IX.

According to Sabtohadhi J et al (2022) , the sample is part of the number and characteristics possessed by the population. If the population is large, and the researcher is unlikely to study everything in the population, for example due to limited funds, time, and energy, Then the researcher can use a sample taken from that population. What is learned from the sample, the conclusion was applicable to the population. In this study, researchers used the Non-Probability Sampling Technique, which is a sampling technique that does not provide equal opportunities / opportunities for each element or member of the population to be selected as a sample. (Sabtohadhi J et al., 2022), and one of the techniques used from the nonprobability side is purposive sampling technique, which is a sampling technique from a number of populations based on certain characteristics or properties of the population.

Data collection was carried out using tests, the test used was a multiple-choice test with choices a, b, c and d consisting of three types of vocabulary namely nouns, verbs and adjectives contained in the Narrative text material. Researchers gave a tryout of 50 questions in the form of multiple choice to students. The instrument indicators in this study only focus on vocabulary such as nouns, verbs and adjectives.

RESULT

Table 1. Hypothesis verification

Test Statistics ^a	
POSTTEST – PRETEST	
Z	-4.288^b
Asymp. Sig. (2-tailed)	<.001
a. Wilcoxon Signed Ranks Test	
b. Based on negative ranks.	

Based on the results of the Wilcoxon Signed Ranks Test, the value of $Z = -4.288$ with Asymp. Sig. (2-tailed) < 0.001 . Because the p value < 0.05 , it can be concluded that there is a significant difference between the pre-test and post-test results. All respondents experienced an increase in scores after using ChatGPT to enhanced their vocabulary mastery.

Thus, the null hypothesis (H_0) stating that ChatGPT cannot improve students' vocabulary acquisition is rejected. Conversely, the alternative hypothesis (H_1) which states that ChatGPT can enhance students' vocabulary mastery, is accepted. The results of these study showed that ChatGPT is effective in helping students improved their vocabulary acquisition, so it can be an effective learning tool in the context of language education.

DISCUSSION

The purpose of this study is to explore whether or not ChatGPT can effectively enhance the vocabulary mastery of 8th grade students at SMP Negeri 12 Bolaang Mongondow Utara. According to Hatmanto (2023), With its extensive knowledge base and ability to generate context-appropriate responses, ChatGPT has the potential to revolutionize the way English education is delivered and experienced. The existence of this study also aims to see and assess the impact of the effectiveness of using ChatGPT on improving students' mastery of English vocabulary. The results of this study indicate that there is an increase in student vocabulary, especially Noun, verb and adjective after being given treatment using ChatGPT.

the improvement in students' vocabulary skills can also be seen from the average of pre-test and post-test mean scores which show a very significant increase. The increase was from 12.13 to 24.63. The analysis revealed Wilcoxon signed rank test results with a P-value of <0.001 and the Z value was -4.288, This value indicates that there is a significant difference between the pre-test and post-test results. as it was below 0.05. This significant p-value supported the hypothesis that ChatGPT can effectively enhance students' vocabulary mastery. In other words, students made progress in mastering vocabulary. These results are in line with research conducted by Shaikh et al (2023), who found that ChatGPT is beneficial in formal English learning tasks and vocabulary and can also create positive experiences and improve students' language skills. Therefore, the researcher concluded that the used of ChatGPT as a medium for learning English, especially vocabulary, can have a positive and effective impact in helping the student learning process.

The results in these findings are align with previous research, such as Tobing & Erlangga (2023), who revealed that the presence of ChatGPT as a powerful language model that can offer many significant benefits in language learning and can be personalized. Similarly, Oktadela et al (2023), showed the use of this Chatbot Application can increase enthusiasm and motivation in learning English not only that students also appear more interested and confident. Furthermore, Shaikh et al (2023), also assessed that ChatGPT is very useful in formal English learning tasks, including vocabulary. Not only that, the results of their research also revealed the fact that students had a positive experience and improvement in their English language skills after using ChatGPT. On the other hand, Monawati & Fauzi (2018), stated that student learning achievement is strongly influenced by the creativity of a teacher such as choosing teaching methods and teaching media. Therefore, researcher can conclude that the use of ChatGPT as a learning media is the right step in the world of education, especially English language learning where ChatGPT offers many advantages and new learning experiences for students at school.

CONCLUSION

The rapid development in the field of technology in this era, especially artificial intelligence technology, provides many benefits that can help humans in almost all aspects of life including aspects of education which can currently be integrated with artificial intelligence products such as ChatGPT which can provide many benefits for teachers and students in the learning and teaching process at school.

The results of this study reveal that the use of ChatGPT in the context of English language learning at school, especially student vocabulary mastery, is very effective. It provides various benefits, such as creating a new learning atmosphere and experience for students and a faster and more personalized learning process.

Based on the hypothesis testing results and the comparison between pre-test and post-test scores, it was evident that the use of ChatGPT had a significant impact on students' vocabulary mastery. The mean score increased substantially from 12,13 in the pre-test to 24,63 in the post-test, and the p-value of <0.001 indicated a statistically significant difference between the pre-test and post-test scores. This suggested that the improvement observed was not due to random chance, but rather due to the effective intervention of using ChatGPT with Narrative text material. The intervention successfully increased students' vocabulary mastery, leading to better performance in the post-test.

REFERENCES

- Adiguzel, T., Kaya, M. H., & Cansu, F. K. (2023). Revolutionizing education with AI: Exploring the transformative potential of ChatGPT. In *Contemporary Educational Technology* (Vol. 15, Issue 3). Bastas. <https://doi.org/10.30935/cedtech/13152>
- Alkadri, S. (2024, January 15). *Pengertian Chat GPT & Cara Menggunakannya*. D3 Teknologi Komputer Telkom University. <https://dce.telkomuniversity.ac.id/pengertian-chat-gpt-cara-menggunakannya/>
- Alsadoon, R. (2021). Chatting with AI Bot: Vocabulary Learning Assistant for Saudi EFL Learners. *English Language Teaching*, 14(6), 135. <https://doi.org/10.5539/elt.v14n6p135>
- Amin, M. Y. M. (2023). AI and chat GPT in language teaching: Enhancing EFL classroom support and transforming assessment techniques. *International Journal of Higher Education Pedagogies*, 4(4), 1–15.

- Anastasi, A., & Urbina, S. (1997). *Psychological testing*. Prentice Hall/Pearson Education.
- Copeland B. Jack. (1998, July 20). *Artificial Intelligence*. Wwww.Britannica.Com.
- Creswell, J. W. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches*.
- Crocker, L., & Algina, J. (1986). *Introduction to classical and modern test theory*. ERIC.
- Elfrieda H. Hiebert, & Michael L. Kamil. (2005). *Teaching and Learning Vocabulary Bringing Research to Practice*.
- Ertel, W. (2017). *Undergraduate Topics in Computer Science Introduction to Artificial Intelligence*. <http://www.springer.com/series/7592>
- Grassini, S. (2023). Shaping the Future of Education: Exploring the Potential and Consequences of AI and ChatGPT in Educational Settings. In *Education Sciences* (Vol. 13, Issue 7). Multidisciplinary Digital Publishing Institute (MDPI). <https://doi.org/10.3390/educsci13070692>
- Hastuti, E. D. (2011). *Pembelajaran dengan Menggunakan Metode Demonstratif Efektif untuk Meningkatkan Penguasaan Kosakata Bahasa Inggris*. <http://www.yourdictionary.com/vocabulary>.
- Hatmanto, E. D. (2023). Revolusi Pembelajaran Bahasa Inggris: Menggali Potensi Transformatif Chat GPT. *Inovasi Dan Daya Saing Dalam Linguistik Dan Pembelajaran Bahasa Asing Masa Kini*, 102.
- Huang, W., Hew, K. F., & Fryer, L. K. (2022). Chatbots for language learning—Are they really useful? A systematic review of chatbot-supported language learning. *Journal of Computer Assisted Learning*, 38(1), 237–257.
- Husnunnisa, I. A. (2025, May 15). *Part of Speech Bahasa Inggris: Definisi, Jenis, dan Contohnya*. English Academy. <https://www.english-academy.id/blog/part-of-speech>
- Janna, N. M., & Herianto, H. (2021). *Konsep uji validitas dan reliabilitas dengan menggunakan SPSS*.
- Kamruzzaman, M. M., Alanazi, S., Alruwaili, M., Alshammari, N., Elaiwat, S., Abu-Zanona, M., Innab, N., Mohammad Elzaghmouri, B., & Ahmed Alanazi, B. (2023). AI-and IoT-assisted sustainable education systems during pandemics, such as COVID-19, for smart cities. *Sustainability*, 15(10), 8354.
- Karyadi, B. (2023). PEMANFAATAN KECERDASAN BUATAN DALAM MENDUKUNG PEMBELAJARAN MANDIRI. *Educate: Jurnal Teknologi Pendidikan*, 8(2), 253–258. <https://doi.org/10.32832/educate.v8i02.14843>
- Lehr, F., Jean Osborn, I., Graves, M., McKeown, M., & Scott, J. (2004). *A Focus on Vocabulary is the second in the Research-Based Practices in Early Reading Series published by the Regional Educational Laboratory at Pacific Resources for Education and Learning. Writers: The Regional Educational Laboratory at Pacific Resources for Education and Learning would like to express sincere thanks to the following reviewers*. www.prel.org/programs/rel/rel.asp.
- Lolang, E. (2014). Hipotesis Nol dan Hipotesis Alternatif. *Jurnal Keguruan Dan Ilmu Pendidikan*, 3(3), 685–695.
- Mawardiyah, N. Z. (2023). Hambatan Pembelajaran Bahasa Inggris Dilingkungan Sekolah Dasar. *Karimah Tauhid*, 2(1), 272–280.
- Mcclenaghan, E. (2023). *The Wilcoxon Signed-Rank Test*.
- Monawati, M., & Fauzi, F. (2018). Hubungan Kreativitas Mengajar Guru Dengan Prestasi Belajar Siswa. *Pesona Dasar: Jurnal Pendidikan Dasar Dan Humaniora*, 6(2).
- Murphy, R. (2002). *English grammar in use* (Vol. 379). Cambridge University Press Cambridge.
- Musianto, L. S. (2002). Perbedaan Pendekatan Kuantitatif dengan Pendekatan Kualitatif dalam Metode Penelitian. *Jurnal Manajemen Dan Kewirausahaan*, 4, 123–136. <http://puslit.petra.ac.id/journals/management/>
- Oktadela, R., Elida, Y., Ismail, S., Pendidikan Bahasa Inggris, P., & UIR Pekanbaru, F. (2023). Improving English Vocabulary through Artificial Intelligence (AI) Chatbot Application. *Print Journal of English Language and Education*, 8, 2023. <https://doi.org/10.31004/jele.v8i2.411>
- Richard, & Renandya. (2002). *Methodology In Language Teaching*.
- Ridha, N. (n.d.). *Proses Penelitian, masalah, Variable dan Paradigma Penelitian*.
- Russell, S., & Norvig, P. (2009). *Artificial Intelligence A Modern Approach Third Edition*. www.PlentyofeBooks.net
- Setiawan, A., & Luthfiyani, U. K. (2023). Penggunaan ChatGPT Untuk Pendidikan di Era Education 4.0: Usulan Inovasi Meningkatkan Keterampilan Menulis. *Jurnal PETISI*, 04(01). <https://chat.openai.com>.

- Shaikh, S., Yayilgan, S. Y., Klimova, B., & Pikhart, M. (2023). Assessing the Usability of ChatGPT for Formal English Language Learning. *European Journal of Investigation in Health, Psychology and Education*, 13(9), 1937–1960. <https://doi.org/10.3390/ejihpe13090140>
- Sitopu, J. W., Purba, I. R., & Sipayung, T. (2021). Pelatihan Pengolahan Data Statistik Dengan Menggunakan Aplikasi SPSS. *Dedikasi Sains Dan Teknologi (DST)*, 1(2), 82–87.
- Songsiengchai, S., Sereerat, B., & Watananimitgul, W. (2023). Leveraging Artificial Intelligence (AI): Chat GPT for Effective English Language Learning among Thai Students. *English Language Teaching*, 16(11), 1–68.
- SUCANDRA, S., Budiman, M. A., & Fajriyah, K. (2022). Analisis Kesulitan Penguasaan Kosakata Pembelajaran Muatan Lokal Bahasa Inggris Pada Siswa Kelas Iv Di Sd Plus Latansa Kabupaten Demak. *Wawasan Pendidikan*, 2(1), 71–80.
- Susanto, A. (2017). *THE TEACHING OF VOCABULARY: A PERSPECTIVE*.
- Ta, T. T., & Nguyen, T. L. (2024). Positive Impacts of Chat GPT on English Teachers. *International Journal of Current Science Research and Review*, 07(06).
- Tavares, M. C., Azevedo, G., & Marques, R. P. (2022). The challenges and opportunities of era 5.0 for a more humanistic and sustainable society—a literature review. *Societies*, 12(6), 149.
- Tobing, N. M. L., & Erlangga, D. T. (2023). *THE ADVANTAGES OF CHAT GPT FOR ENHANCING STUDENTS VOCABULARY*.
- Veronica, A., Abas, M., Hidayah, N., Sabtohadhi, J., Marlina, H., Mulyani, W., & Aulia, S. S. (2022). Metodologi Penelitian Kuantitatif. *PT. Global Eksekutif Teknologi*.
- Webster Tristian Kanwar, M., & Automation, R. (2023). *Definition Of Artificial Intelligence*. https://en.wikipedia.org/wiki/Artificial_intelligence
- Yakob, R., Huljannah, M., Jupri, J., & Wahyuni, S. (2023). PEMBELAJARAN BAHASA YANG DIDUKUNG AI: MENINGKATKAN KEMAMPUAN BAHASA INGGRIS. *BaJET (Baturaja Journal of Education Technology)*, 7(2), 476–479.
- Yulianri, G., Benardi, Permana, N., & Kusuma Wijayanti, F. A. (2023). JISMA+Transformasi+AI+Pendidikan+Indonesia. *Journal Of Information Systems And Management*, 02 No. 06.