

English Learning Strategies based on Artificial Intelligence (AI)

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ABSTRACT

Mastering English is needed to face the era of globalization. English plays a strategic role in international communication, both technology and education. This study aimed to explore English learning strategies based on Artificial Intelligence (AI). By using a literature study through a descriptive qualitative approach, this study was expected to provide comprehensive results. The results of this study indicated that AI-based English learning strategies offered a more interactive and personal approach to developing students' language skills. One of the commonly used an AI-based learning platform such as an AI-based virtual assistant. For instance, Duolingo, Grammarly and ChatGPT which can facilitate English speaking and listening practice. Meanwhile, English learning based on Artificial Intelligence (AI) technology has a number of challenges that need to be considered in its implementation, both in terms of technical, pedagogical, and social aspects. The first challenge that is often faced was the limited ability of AI to understand the context and the nuances of language in depth. English has grammatical and idiomatic complexities that are often difficult for AI systems to understand. Although AI can perform syntactic and semantic analysis, understanding meaning in the context of a broader conversation or text was still remains a challenge.

Keywords : Strategies, English Learning, Artificial Intelligence (AI).

INTRODUCTION

English learning has become an increasingly important need in the era of globalization (Adisti et al., 2022; Kholis, 2021; Ngersawat & Kirkpatrick, 2014). English as a lingua franca plays a strategic role in international communication, both in economics, education, and technology (Adisti et al., 2022). However, mastery of English in Indonesia is still a major challenge, especially in terms of listening, speaking, reading, and writing skills (Meha & Roshonah, 2014). This problem is caused by various factors, such as limited study time, lack of practice, and minimal access to quality learning resources. Along with technological advances, innovation in the world of education continues to grow. One technology that receives special attention is Artificial Intelligence (AI) (Usman et al., 2020). AI technology has great potential to transform English learning, from providing real-time feedback to personalizing learning according to each student's needs. With AI, the learning process can be more interactive, adaptive, and effective (Guan et al., 2024).

However, the application of AI technology in English learning in Indonesia is still relatively new and not yet optimal. Many teachers and educational institutions

do not fully understand how to utilize AI to improve the quality of learning. In addition, limited technological infrastructure, such as unequal internet access. It is also a major obstacle in the implementation of AI (Dini et al., 2020). In the context of English learning, one of the biggest challenges is creating a learning environment that supports the development of active communication skills. Conventional methods, such as lectures and memorization. They are often not effective enough to hone these skills. This is where AI technology offers solutions, such as AI-based chatbots for conversation simulations, speech recognition applications for practicing pronunciation, and analytical tools to monitor individual student progress (Suryarin et al., 2024).

In addition, personalization of learning is a major advantage of AI-based strategies. With big data analysis, AI can understand students' learning patterns, detect their weaknesses, and recommend appropriate materials or activities. This allows students to learn at their own pace, which ultimately increases motivation and learning outcomes. However, the implementation of this strategy is not without challenges. One of them is the readiness of educators. Teachers

not only need to understand AI technology but also be able to integrate it into their curriculum and teaching methods. Therefore, special training is needed to equip teachers with the necessary skills (Novita et al., 2024).

In addition, ethical and data security aspects also need attention. The use of AI involves the collection and analysis of students' personal data, which can pose privacy risks if not managed properly. Therefore, educational institutions need to ensure that the technology used complies with data security and protection standards. On the other hand, the application of AI in English learning can also open up great opportunities to create educational inclusivity. AI can help students with special needs, such as hearing or visual disabilities, to learn English through special assistive devices. This is in line with the principle of inclusive education which provides equal access for all students. However, the success of implementing AI-based learning strategies is highly dependent on the collaboration of various parties, including the government, educational institutions, technology developers, and the community. The government needs to provide supportive policies, such as the provision of technological infrastructure and incentives for educational innovation (Zhai et al., 2024).

The relevant research in this study are as follows: First, the research was proposed by Yang and Wang (2022). They states that Artificial Intelligence (AI)-based learning strategies are an innovation in the world of education, including in English language learning. AI offers an adaptive and personalized approach, allowing students to learn according to their individual needs and abilities. One example is AI-based learning applications such as Duolingo and Grammarly which utilize algorithms to provide instant feedback, detect errors, and offer gamification-based learning. The use of AI technology in language learning increases student motivation because of its interactive and intuitive nature.

Second, the research conducted by Li et al. (2021) pointed the fact that AI also supports learning with big data processing capabilities, enabling real-time analysis of student progress. Teachers can use platforms such as Google Classroom is powered by AI to track student progress, design relevant materials, and provide more targeted learning. Another strategy is an AI chatbot for English conversation simulation. Besides, Li et al. (2021) claims that students who used a chatbot to practice conversation showed improvements in their speaking fluency and confidence.

Third, Sharples' (2020) states that the implementation of AI-based learning strategies requires attention to challenges such as technology gaps and teacher training needs. This study emphasizes the importance of intensive training for teachers to utilize AI effectively. In addition, an integrative curriculum development is needed so that AI is not only a supporting tool, but also an integral part of the learning process. With a holistic approach, AI can be a solution to improve students' English competence in the digital era.

This study aims to explore AI-based learning strategies in English language learning. The focus is to identify the advantages, challenges, and opportunities offered by this technology. By understanding this, it is hoped that recommendations can be formulated that can improve the effectiveness of English language learning in the classroom. The use of AI in English language learning is also relevant to global trends in education, namely technology-based and student-centered learning. Therefore, it is important to see how AI technology can be integrated with other learning methods to create a holistic approach. Thus, this study has strategic value in developing technology-based education in Indonesia. The results of this study are expected to provide insight for teachers, policy makers, and educational technology developers to create relevant solutions and positive impact.

REVIEW OF RELATED LITERATURE

One strategy that is widely used in AI-based English learning is the use of adaptive learning systems. These systems adjust the difficulty of the material and the type of exercises based on the student's previous performance. For example, if a student shows difficulty in understanding a particular grammar or vocabulary, the AI will provide additional practice in that area until the student feels more confident. This approach allows each student to learn at their own pace, which increases their engagement and motivation to continue learning (Waluyo & Kusumastuti, 2024).

In addition, AI also allows the integration of speech recognition technology in English learning. By using AI-based tools such as speech recognition applications, students can practice their speaking skills independently. The application will provide direct feedback on the pronunciation, intonation, and fluency of students' speech, which is very helpful in improving their speaking skills. This technology can also be used to simulate conversations with native speakers, providing a more realistic speaking experience for students who do not have direct access to an English-speaking environment.

Further, speech recognition, AI can be applied in English learning through the use of chatbots or virtual assistants. AI-based chatbots can serve as conversation partners for students, providing an opportunity to practice speaking English in a more relaxed and informal context. Students can interact with the chatbot anytime and anywhere, increasing the opportunity to practice speaking without time or place constraints. These chatbots can also adjust their responses according to the student's ability level, making them a very useful tool in personalized learning (Mayangsari & Tiara, 2019).

Finally, AI can facilitate English language learning by providing in-depth data analysis for teachers. Using AI-based learning platforms, teachers can track student progress in real-time and gain

insights into areas for improvement. This data allows teachers to design more targeted teaching strategies, tailoring their approach based on each student's needs. Overall, the application of AI in English learning strategies provides various benefits, both in terms of efficiency, personalization, and effectiveness (Becker & Edalatihams, 2019).

METHODOLOGY

This research used a literature study method with a descriptive qualitative approach to explore various studies and articles that discuss English learning strategies based on Artificial Intelligence (AI) (Moleong, 2006; Sugiyono, 2019). This literature study intended to identify various AI technologies applied in English teaching, such as duolingo, Grammarly, and ChatGPT. They can provide an interactive learning experience. The data collection was carried out by accessing some scientific articles, journals, books, and other trusted sources that are relevant to the topic of English learning and the role of AI in the process. The first step in this study was to identify sources that discuss the application of AI in English learning, especially those that include experimental studies and theories related to the implementation of AI in education. The selected articles were then analyzed to see the various learning strategies used in the application of AI technology, as well as their effectiveness in improving English language skills, both in speaking, writing, listening, and reading skills. The main focus was on the use of AI to personalize learning experiences, data-driven teaching, and deeper student interaction with subject matter. Furthermore, the results of this literature study analysis would provide a comprehensive overview of strategies and challenges, as well as the potential for developing AI-based English learning strategies. By integrating AI technology, it was hoped that the learning process will become more efficient, interactive, and in accordance with the individual needs of students. This study also

identified gaps in the existing literature, as well as provide recommendations for further research on the role and influence of AI in English learning in the future.

FINDINGS AND DISCUSSIONS

AI-based English learning strategies

AI-based English learning strategies offered a more interactive and personalized approach to developing students' language skills. One common strategy is through AI-based learning platforms that can adjust the material and difficulty level according to each student's ability. For instance, AI learning apps or software can provide grammar, vocabulary, and speaking skills exercises that are tailored to students' progress, allowing them to learn at a pace that suits their level of understanding. Moreover, the use of AI-based virtual assistants, such as Duolingo, Grammarly, and ChatGPT. They can facilitate English speaking and listening practice. Students can interact with these AI assistants in real conversations, allowing them to hone their speaking and listening skills more effectively. Features such as accurate speech recognition can also help students identify pronunciation errors and provide immediate feedback, accelerating their learning. The results of this study were as follows:

Duolingo

English language learners have already taken advantage of Duolingo. It was well known as one of the language learning program. Numerous research have been carried out to assess how well Duolingo works for enhancing students' English language proficiency. According to a study, students' English speaking abilities can be enhanced by utilizing Duolingo as a technology-based learning tool. Following multiple Duolingo learning cycles, the proportion of students in this research who obtained scores higher than the Minimum Completion Criteria (KKM) (Xie, 2024). Further, utilizing Duolingo boosted students' motivation to speak English and their sense of self-worth. According to a different study,

Duolingo helps pupils become more proficient in English vocabulary. The findings demonstrated that utilizing Duolingo improved the complexity understanding.

In addition, the use of Duolingo as a learning medium in English listening skills has also been explored. Qualitative descriptive research showed that Duolingo can be an effective alternative learning medium in improving students' listening skills. However, several studies also emphasized the importance of mentoring and integrating Duolingo with other learning methods. Although Duolingo can increase students' motivation and learning independence, the role of teachers in guiding and providing context remains crucial to achieving optimal learning outcomes. Overall, the use of Duolingo in English learning showed that positive results in improving various language skills of students. However, its effectiveness will be more optimal if combined with traditional learning methods and supported by the active role of teachers in the learning process (Annamalai et al., 2023).

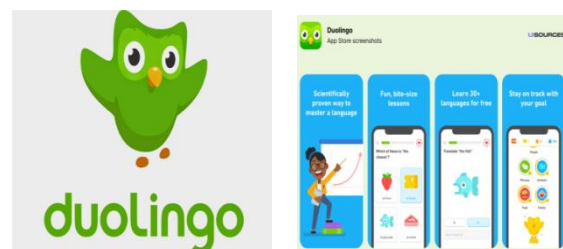


Figure 1. Duolingo application usage display

Grammarly

The results of the study showed that using Grammarly can help improve students' English writing skills. This application provided accurate corrections to grammar, spelling, and sentence structure errors, making it easier for students to learn from their mistakes and improve the quality of their writing. In addition, Grammarly also offered a recommendation feature that can help students understand difficult grammar concepts. For example, the "explanation"

feature explains why a sentence is considered incorrect and how to correct it, which provides a more in-depth learning experience for students. This showed that Grammarly is not only an error-checking tool but also an effective learning aid. However, although Grammarly is very useful in correcting technical errors. The study also found that this application does not completely replace an in-depth understanding of the context and nuances of language. Some errors related to word choice and writing style still occur, even though this application provides suggestions for improvement. Therefore, the use of Grammarly should be supplemented with face-to-face learning or additional instruction from teachers (Asril et al., 2024).

Besides, the research findings suggested that using Grammarly is more effective for individual learning than for groups. Users can receive more personalized and immediate feedback, which facilitates faster improvement. This is in line with learning theories that emphasize the importance of timely feedback in the learning process. Students who use Grammarly regularly show significant improvements in their writing, especially in terms of spelling and grammatical errors. However, the study also noted that reliance on this application can reduce opportunities for students to develop their analytical skills in writing. Therefore, it is advisable to use Grammarly as an aid, not as a substitute for basic knowledge in English. Overall, the use of Grammarly in English learning provides significant benefits in helping students overcome technical errors in writing. Despite some shortcomings, such as reliance on the application and lack of understanding of the broader context, Grammarly remains a very useful tool in improving students' writing skills (Asril et al., 2024).



Figure 2. The Display of Grammarly application usage

ChatGPT

This study aimed to analyze the effectiveness of using ChatGPT in English language learning. The results showed that ChatGPT can improve students' understanding in various aspects of English, such as grammar, vocabulary, and writing skills. Students who use ChatGPT regularly report significant progress in their writing skills, because ChatGPT provides immediate feedback that helps them correct mistakes (Salih et al., 2025).

Further, ChatGPT also serves as an interactive tool that allows students to practice English conversation independently. This feature gives students the opportunity to speak English without the fear of being wrong or judged, which is often a barrier in traditional learning. Thus, ChatGPT acts as a safe and supportive platform for students to improve their speaking skills.

One of the important findings in this study is how ChatGPT facilitates self-directed learning. Students can access ChatGPT anytime and anywhere to get explanations about English concepts that they do not understand. With this easy access, students can learn more autonomously and reduce their dependence on formal teaching. However, despite the many benefits, this study also found some challenges. Some students found it difficult to interpret ChatGPT responses that were too technical or too simple. This suggests that adjustments to the complexity level of ChatGPT conversations are needed to better suit the individual needs of each student (Baek et al., 2023).

Furthermore, although ChatGPT is able to provide good explanations of English concepts, some students feel that interaction with a human teacher is still irreplaceable. Face-to-face teaching is still considered more effective in providing deeper insights into the context and application of language

in real-life situations. Overall, the results of this study indicated that ChatGPT can be a very useful tool in English learning, especially in accelerating students' understanding of the material. However, the use of ChatGPT should be combined with conventional learning methods to achieve optimal results. The integration of these two methods can produce a more holistic and effective learning experience (Baek et al., 2023).

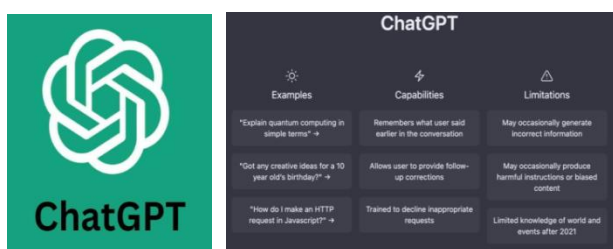


Figure 3. ChatGPT application usage display

AI-Based English Learning Challenges

English language learning based on artificial intelligence (AI) technology has grown rapidly in recent years. Although AI offered various benefits in enhancing the learning experience, there are a number of challenges that need to be considered in its implementation, both in terms of pedagogical, technical, and social. The first challenge that is often faced is the limited ability of AI to understand the context and nuances of language in depth. English as an international language has grammatical and idiomatic complexities that are often difficult for AI systems to understand. Although AI can perform syntactic and semantic analysis, understanding meaning in the context of a broader conversation or text is still a challenge (Annamalai et al., 2023; Guan et al., 2024).

Additionally, while AI can offer personalized learning based on an individual's needs and abilities. These systems are sometimes less able to adapt to cultural differences and language

backgrounds of users. Often, AI algorithms use training data derived from more standard English, without considering the language variations used in different countries or communities. This can affect the effectiveness of learning for students from different language backgrounds.

The next challenge is the issue of limited social interaction in AI-based English learning. Effective language learning often involved rich human interaction, such as live conversations with teachers or classmates. AI, although it can simulate conversations, cannot completely replace the importance of social interaction that occurs in a classroom environment. This limitation can reduce students' ability to hone their speaking and listening skills in a natural context, which is essential for better language acquisition (Asril et al., 2024).

Another aspect that affect the challenges of AI-based English learning is the issue of security and data privacy. The use of AI in education usually requires the collection and analysis of student data, such as learning habits, strengths, and weaknesses in English. While this data can be used to improve the learning experience, the use of personal data also carries risks related to privacy and potential misuse of information. Therefore, it is important to ensure that there is a clear and transparent policy on the management of student data in AI-based learning.

Moreover, AI in English language learning often relies on adequate technical resources, such as sophisticated hardware and a stable internet connection. In many areas, especially in developing countries, access to these technologies can be limited. This issue can exacerbate the gap in AI-based English education, with students from areas with limited technology at risk of falling behind in their English language development. Therefore, it is important to address the issue of technological accessibility so that AI in English language learning can be more widely accepted (Wilendra et al., 2024).

One of the main challenges in implementing AI in English language learning is resistance to change. Many educators and educational institutions may be hesitant to replace traditional teaching methods with new technologies. Uncertainty about the effectiveness of using AI in English language teaching makes most stakeholders prefer proven conventional methods. Therefore, education and training for teachers on the advantages and uses of AI in language teaching is essential.

Another equally important challenge is the issue of accuracy and errors in translation or assessment carried out by AI. AI-based machine translators or language assessment tools may fail to provide accurate results in some cases, especially in translating phrases or sentences that have ambiguous or idiomatic meanings. These errors in assessment can confuse students and hinder their learning process. Therefore, a human correction or validation system is needed to ensure that the use of AI in English learning does not produce incorrect information.

Differences in students' learning styles are also a major challenge. AI may be able to adapt content to different levels of ability, but not all students learn the same way. Some students prefer to learn through visual methods, while others prefer to learn auditorily or kinesthetically. AI-based learning may not be able to fully accommodate this diversity of learning styles optimally. Therefore, developing AI that is more responsive to individual learning styles is something that needs to be considered to improve the effectiveness of English learning.

The propensity to rely solely on AI for English language acquisition presents another difficulty since it may lessen the value of human instruction. Direct communication with the teacher is still crucial for providing greater context and explicitly addressing mistakes, even though AI can assist with technical abilities like grammar and vocabulary. Human assistance is necessary for effective language

acquisition in order to inspire pupils, help them overcome obstacles, and offer helpful criticism. AI should not be viewed as a full substitute for teachers in English language instruction, but rather as a supplementary tool.

Finally, while AI can offer many opportunities in English language learning, cost-related challenges must also be considered. The development and implementation of quality AI technology requires significant investment in research, software development, and technical infrastructure. In addition, the cost of a subscription to an AI-based learning platform or the hardware required can be a burden for some students or educational institutions, especially in countries with limited education budgets. Therefore, it is important to find learning solutions that can reduce costs while maintaining high learning quality (Anggraini, 2022; Becker & Edalatishams, 2019; Waluyo & Kusumastuti, 2024). Thus, while AI-based English learning offers many potentials, the challenges involved cannot be ignored. A balanced approach between technology and human interaction, as well as policies that support privacy and accessibility, are essential to ensure that AI technology can be used effectively in English learning.

CONCLUSIONS

AI-based English learning strategies offer a more interactive and personalized approach to developing students' language skills. One common strategy is through an AI-based learning platform that can adjust the material and level of difficulty according to each student's ability. For example, AI learning applications or software can provide grammar, vocabulary, and speaking skills exercises that are tailored to students' progress, allowing them to learn at a pace that suits their level of understanding. As for its use, such as AI-based virtual assistants, such as Duolingo, Grammarly and ChatGPT, which can facilitate English speaking and listening practice. Students can interact with these AI assistants in real

conversations, allowing them to hone their speaking and listening skills more effectively. Meanwhile, English learning based on artificial intelligence (AI) technology has a number of challenges that need to be considered in its implementation, both in terms of technical, pedagogical, and social. The first challenge that is often faced is the limited ability of AI to understand the context and nuances of language in depth. English as an international language has grammatical and idiomatic complexities that are often difficult for AI systems to understand. Although AI can perform syntactic and semantic analysis, understanding meaning in the context of a broader conversation or text is still a challenge.

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