Advanced International Journal for Research (AIJFR)
E-ISSN: 3048-7641 ● Website: www.aijfr.com ● Email: editor@aijfr.com

The Use of Artificial Intelligence Tools in EFL Vocabulary Acquisition in the Saudi Context: A Focused Systematic Review

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Abstract

Vocabulary acquisition plays an essential role in learning English as a Foreign Language (EFL), especially in contexts like Saudi Arabia where learners have limited exposure to English outside the classroom. In recent years , artificial intelligence (AI) tools have become more widely used to support vocabulary learning through interactive and personalized approaches. This study provides a focused systematic review of empirical research on the use of AI tools in EFL vocabulary learning, with particular attention to Saudi learners. It explores how these tools influence vocabulary outcomes, including retention , breadth, and depth of knowledge. The findings indicate that AI tools can enhance vocabulary development and increase learner motivation. However, some challenges remain , such as concerns about long term retention and the reduction of human interaction. Overall, the study emphasizes the need for a balanced and effective integration of AI tools within Saudi EFL classrooms.

Keywords: Artificial Intelligence (AI), Saudi EFL Learners, Vocabulary Retention, AI-Assisted Language Learning.

1. Introduction

Vocabulary plays a central role in learning English as a Foreign Language (EFL). Without sufficient vocabulary knowledge , learners struggle with reading , listening, speaking, and writing .In Saudi Arabia, this issue is more noticeable because students have limited opportunities to use English outside the classroom. As a result , vocabulary learning depends heavily on formal instruction and available learning tools. In recent years, Saudi Arabia has emphasized digital transformation in education. Artificial intelligence (AI) tools such as Duolingo, chatbots, and ChatGPT are now widely used in language learning. These tools provide immediate feedback, repeated practice , and interactive learning experiences. Since vocabulary learning requires continuous exposure and use , AI tools appear to offer useful support.

However , despite the growing use of AI tools in language learning, their effectiveness in improving EFL vocabulary acquisition remains unclear. Previous studies have reported mixed findings regarding vocabulary retention, learner engagement, and depth of vocabulary knowledge (Alghamdi, 2025; Abdelhalim & Alsehibany, 2025). In addition , Saudi EFL learners continue to face challenges related to limited English exposure outside the classroom, which may influence the effectiveness of digital learning tools (Ibrahim , 2023). Therefore , more focused research is needed to better understand how AI tools can support vocabulary learning in the Saudi context.

Research Question

What effects do artificial intelligence tools have on vocabulary learning outcomes in EFL contexts , particularly in Saudi Arabia (e.g., retention, breadth, and depth)?

Literature Review

Vocabulary learning is widely recognized as a complex process that includes both vocabulary breadth and depth. Breadth refers to the number of words learners know , while depth refers to how well they understand and use those words. In Saudi Arabia, many learners struggle to develop both aspects due to limited exposure to English and reliance on traditional teaching methods (Alherabi & Aljebreen , 2025).

Traditional vocabulary instruction often focuses on memorization , which may help learners remember words temporarily but does not support long term retention or deeper understanding. As a result, researchers have explored alternative approaches, including digital and AI supported learning.

Technology based learning has been shown to improve engagement and motivation. According to Alhusaiyan (2025) , digital tools create more flexible learning environments and encourage learner autonomy. AI tools go a step further by providing personalized learning experiences , where content and feedback are adapted to the learner's level. This makes learning more efficient and interactive.

Several studies support the effectiveness of AI tools in vocabulary learning. Abu Qbeita (2024) found that students using Duolingo achieved higher vocabulary scores than those receiving traditional instruction. Similarly, Alhusaiyan (2025) and Alghamdi (2025) argue that AI tools improve vocabulary learning through personalized practice, immediate feedback, and increased learner engagement.

Similarly, Kim (2018) showed that chatbot based learning improved vocabulary knowledge among Korean EFL students. In addition to improved performance , students reported higher motivation. This is important because motivation is closely linked to language learning success.

Behforouz et al. (2025) found that chatbot based learning improved both receptive and productive vocabulary knowledge, including delayed post test performance. Similar findings were reported by Kim (2018) and Mugableh (2024), who also found positive effects of AI assisted learning on vocabulary development and retention. Together, these studies suggest that AI tools may support vocabulary retention, although most studies remain limited in duration.

In the Saudi context, Mugableh (2024) found that ChatGPT based vocabulary activities significantly improved vocabulary size and word family knowledge. This study provides direct evidence that AI tools can be effective in Saudi classrooms.

Other research also highlights the positive role of AI tools in Saudi education. Alherabi and Aljebreen (2025) found that AI supported vocabulary learning enhances student engagement and provides structured learning opportunities. Similarly, Alghamdi (2025) reported that Saudi students generally have positive attitudes toward AI tools , noting that they make learning faster and more interactive.

However, not all findings are entirely positive. Some studies highlight challenges such as technical issues, lack of cultural relevance , and reduced human interaction (Alghamdi, 2025). These factors may limit the effectiveness of AI tools if they are not used carefully.

A broader perspective is provided by Şahin Kızıl et al. (2025) , who conducted a systematic review of chatbot use in language learning. They concluded that vocabulary is one of the most improved areas when using AI tools. However, they also noted that differences in research design , duration, and measurement methods make it difficult to compare results across studies.

Overall, the literature suggests that AI tools are effective in improving vocabulary learning, particularly vocabulary breadth and learner engagement. However, there is still limited evidence regarding vocabulary depth and long term retention. This gap is especially important in the Saudi context , where sustainable language development is a key goal.

the findings of these studies are generally positive, several limitations should be noted. Many studies rely on short term interventions and small sample sizes , which raises concerns about the sustainability and generalizability of their results. In addition, differences in assessment methods make it difficult to compare findings across studies. Most importantly , the focus tends to be on vocabulary breadth, while deeper aspects of vocabulary knowledge, such as contextual use and collocations, are often overlooked. These limitations highlight the need for more consistent, long term research , particularly in the Saudi context.

Methodology

This study adopts a focused systematic literature review design. Instead of collecting primary data, it analyzes existing empirical research to examine the use of AI tools in EFL vocabulary learning. Google Scholar was used as the primary database, supported by peer reviewed journals in applied linguistics and educational technology. The search process included keywords such as artificial intelligence, AI, chatbot ,ChatGPT, vocabulary learning , vocabulary acquisition, and EFL. The review focused on studies published between 2018 and 2026 in order to catch recent developments in AI supported language learning.

To ensure relevance and quality, studies were selected based on specific criteria. Included studies focused on vocabulary learning outcomes , involved EFL learners, and examined AI based tools such as chatbots, adaptive applications , or generative AI systems. Studies that focused only on ESL contexts or did not provide empirical data were excluded. The selection process involved screening titles , reviewing abstracts, and analyzing full text articles. Each selected study was then examined based on research design , participant characteristics, duration, type of AI tool, vocabulary outcomes , and main findings. The results were compared using a narrative synthesis approach to identify patterns and differences across studies.

Discussion

The findings of this review indicate that AI tools have a generally positive impact on vocabulary learning, particularly in enhancing vocabulary breadth through repeated exposure and structured practice, as well as increasing learner motivation. Interactive platforms such as chatbots create more engaging learning

environments , which is especially important in the Saudi context where opportunities for authentic language use are limited . In addition, AI tools facilitate personalized learning by adapting to individual learner needs, supporting the effectiveness of adaptive learning systems highlighted by Alhusaiyan (2025). However, these findings should be interpreted with caution. A significant number of studies rely on short term interventions and small sample sizes , raising concerns about the sustainability and generalizability of the reported outcomes. Furthermore, inconsistencies in assessment methods across studies make direct comparison difficult. While gains in vocabulary breadth are consistently observed, deeper aspects of lexical knowledge, including contextual usage and collocational competence , remain underexamined. In the Saudi context, additional factors such as technical constraints and reduced teacher learner interaction may further limit the effectiveness of AI based learning (Alghamdi, 2025). Taken together , these limitations point to the need for more rigorous , longitudinal research to better understand the role of AI tools in supporting sustainable and comprehensive vocabulary development.

Conclusion

This study reviewed the use of AI tools in EFL vocabulary learning , with a particular focus on Saudi Arabia. Overall, the findings suggest that AI tools can play a beneficial role in improving vocabulary acquisition , especially in terms of expanding vocabulary breadth and increasing learner motivation. Features such as repeated exposure, immediate feedback , and interactive activities encourage learners to engage more actively with new vocabulary. This is especially valuable in Saudi Arabia , where opportunities to practice English outside the classroom are often limited.

Despite these advantages, several important limitations remain. Most existing studies emphasize short term gains , while there is still a lack of evidence regarding long term retention and deeper vocabulary knowledge. For this reason, AI tools should be considered as a support to traditional teaching rather than a replacement. Teachers continue to play a central role in guiding and supporting the learning process. Future research should focus on long term effects and explore more detailed aspects of vocabulary use , particularly within the Saudi context. Overall, a balanced combination of AI tools and traditional teaching methods is likely to provide the most effective approach to vocabulary learning.

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