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INTEGRATING AI TECHNOLOGIES INTO VOCABULARY LEARNING: A STUDY OF SAUDI EFL LEARNERS' PERCEPTIONS, USAGE BEHAVIOURS, AND CHALLENGES

Ayesha Junaid^{1*}

¹Department of English. College of Sciences and Humanities, Prince Sattam bin Abdul Aziz University, Al-kharj, Kingdom of Saudi Arabia. Email: a.sarfrazkhan@psau.edu.sa

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Corresponding Author: Ayesha Junaid
(a.sarfrazkhan@psau.edu.sa)

ABSTRACT

This study examined EFL learners' perceptions and actual practices concerning the use of artificial intelligence (AI) tools for English vocabulary acquisition, as well as the challenges they encounter when employing such technologies. A mixed-methods approach was adopted: quantitative data were generated through a closed-ended questionnaire, while qualitative insights were obtained from open-ended responses. Participants included 200 EFL students enrolled at a public university in Saudi Arabia. The quantitative findings showed that learners generally expressed favourable attitudes toward AI-supported vocabulary learning. They viewed AI applications as more effective and advantageous for vocabulary development than conventional learning strategies. The results further indicated that Saudi learners predominantly relied on AI tools for translating words and expressions and for exploring synonyms and antonyms. Despite these benefits, students raised concerns about technical difficulties, insufficient cultural and linguistic contextualization, limited human interaction, and ethical issues such as data privacy, accuracy, and potential algorithmic bias. The findings also demonstrated a positive relationship between learners' perceptions and their actual use of AI for vocabulary learning. The study concludes by offering recommendations for optimizing the integration of AI tools in vocabulary instruction and outlines directions for future research.

KEYWORDS: Artificial Intelligence (AI); Vocabulary; Students; English as a Foreign Language (EFL).

1. INTRODUCTION

In recent decades, EFL instruction has undergone substantial transformation, shifting from conventional teacher-centred practices to contemporary approaches enriched with diverse digital tools (Elmahdi et al., 2025). A growing body of research demonstrates that technology-enhanced language learning often yields superior outcomes compared with traditional methods, underscoring its powerful role in fostering learners' knowledge and skills (Aldowsari & Aljebreen, 2024). At the same time, the rapid expansion of digital technologies and internet-based systems has accelerated the development of artificial intelligence (AI), which now permeates numerous aspects of daily life. AI has captured considerable public interest and has simultaneously become a focal point of scholarly inquiry, particularly among educational technologists exploring its pedagogical value and influence on learner engagement (Alharbi & Hassan Al-Ahdal, 2025).

In EFL contexts, the use of AI tools has expanded markedly in recent years, supporting increased learner motivation, improved instructional efficiency, and broader access to learning materials (Jomaa, Attamimi & Al Mahri, 2024). These tools are capable of providing individualized learning pathways and practice opportunities tailored to students' proficiency levels, needs, and preferences. Additionally, AI systems offer instant, personalized feedback on language components such as vocabulary, grammar, and pronunciation, thereby enhancing student engagement and facilitating better learning outcomes (Alqaed, 2024). Such affordances promote learner autonomy, encouraging students to play a more active role in directing their language development.

Despite these advantages, vocabulary acquisition continues to be one of the most challenging aspects of English learning for EFL students, largely due to the language's linguistic complexity and extensive lexical inventory (Ali et al., 2025). Vocabulary growth is incremental and unfolds throughout a student's academic progression, with expectations increasing substantially at the tertiary level. Ali et al. (2024) noted that many Saudi university students struggle to attain the English proficiency necessary for academic success, with limited vocabulary knowledge identified as a central issue. This gap has made it difficult for educators and stakeholders to determine the most effective strategies for supporting learners, particularly since even well-designed instructional approaches may not fully cater to diverse individual learning needs (Ali et al.,

2023).

Integrating AI into vocabulary instruction offers a promising avenue for addressing these challenges. AI-driven tools can support deeper learning by generating contextually relevant texts, enabling adaptive and interactive dialogue, and offering meaningful exposure to new lexical items (Alhalangy & AbdAlgane, 2023). Elmahdi, Allehyani and AbdAlgane (2025) emphasized that understanding the perspectives of students, instructors, and administrators is essential for ensuring the effective integration of AI in academic environments. Nevertheless, little research has explored EFL learners' perceptions, practices, and challenges related to AI-based vocabulary learning in Saudi Arabia. To address this gap, the present study investigates how Saudi EFL students perceive the use of AI for vocabulary development, examines their engagement with AI tools, and identifies the obstacles they encounter while using them.

1.1 Significance of the Study

This study holds relevance for educators, researchers, and policymakers seeking to advance language education and better meet the needs of EFL learners. Its principal aim is to elucidate how AI can facilitate vocabulary growth in EFL environments. By analysing learners' perceptions of AI as a supportive vocabulary-learning tool, the study provides valuable insights into its perceived usefulness, pedagogical potential, and overall impact. These findings can inform the design of future technologies and instructional practices that align more closely with students' diverse learning profiles.

In a rapidly evolving digital era, it is crucial to evaluate both the strengths and limitations of emerging educational technologies such as AI. By addressing an evident gap in existing literature, the present study contributes to ongoing discussions on integrating AI into language learning and offers practical implications that may enhance vocabulary instruction for EFL students.

1.2. Research Questions

This study seeks to address the following research questions:

1. How do Saudi EFL learners perceive the use of AI tools for vocabulary development?
2. To what degree do Saudi EFL learners engage with AI tools to support their vocabulary learning?
3. Is there a relationship between students' perceptions and their actual practices

regarding the use of AI tools for vocabulary learning?

2. LITERATURE REVIEW

2.1 Research on AI Technologies

Artificial intelligence (AI) has emerged as a significant area of technological innovation, nurtured by rapid advancements in intelligent systems and automation (AbuSahyon, Alshorman & Al-Absi, 2023). Numerous AI-driven developments now enable machines to participate in tasks traditionally associated with human creativity and reasoning. AI broadly encompasses software systems capable of analysing data and executing autonomous actions, including complex computational functions. Intelligent platforms ranging from digital applications to robotic systems are designed to simulate human-like decision-making processes and cognitive abilities (Alsaawi, 2025).

From a disciplinary standpoint, AI can be defined as a branch of computer science concerned with designing systems that demonstrate intelligent behaviour and problem-solving capabilities (Alzahrani & Saleh, 2025). The field focuses on training computational models to process information efficiently and emulate rational thinking. AI is therefore rooted in the study of human and machine intelligence and seeks methods to improve or extend such capabilities. Based on predefined objectives, AI systems can generate predictions, produce recommendations, or take decisions that influence real or digital environments.

2.2. Technology Acceptance Model

The study of technological adoption has long been central to information systems research. One of the most influential frameworks in this domain is the Technology Acceptance Model (TAM), originally proposed by Davis and later expanded by Venkatesh and Davis (Ozili, 2025). TAM has been extensively applied to explore users' acceptance and adoption of new technologies, particularly in educational contexts (Asif & Sarwar, 2025). The model highlights two primary determinants of technology usage: perceived ease of use (PEOU) and perceived usefulness (PU). PEOU refers to the extent to which individuals believe that a technological tool is uncomplicated and effortless to use, whereas PU concerns users' perceptions of how effectively the technology can enhance their performance and productivity (Jiang, Li & Gan, 2025).

2.2 AI in an EFL Context

In recent years, AI has gained substantial

prominence in education, especially within English as a Foreign Language (EFL) learning. AI-powered tools have been incorporated into EFL classrooms to enhance teaching practices, improve language assessment, and support learners in developing linguistic proficiency. Numerous studies have addressed the pedagogical impact of AI in EFL settings (Li & Zhao, 2025).

For example, Wei (2023) found that AI-assisted instruction significantly improved English learning outcomes, increased learner motivation, and enhanced students' ability to regulate their own learning. Learners exposed to AI tools outperformed those in traditional learning environments across multiple domains. AI contributed to higher engagement and more personalized learning pathways, which ultimately fostered learner autonomy.

Similarly, Mohamed (2024) examined the integration of AI applications such as ChatGPT in English language learning. The findings affirmed that AI tools can effectively complement conventional instructional methods. Nonetheless, concerns were raised about potential negative consequences, including possible reductions in critical thinking and the risk of reinforcing bias or misinformation.

Alsahli et al. (2025) explored the use of ChatGPT as a supportive tool for university students with special educational needs (SEN) in Saudi Arabia. Using survey data from 283 participants, the study found that students' perceptions of ChatGPT's usefulness differed depending on the nature of their disabilities and their academic level. The findings revealed variation in how students evaluated ChatGPT's capacity to enhance communicative adaptability, offer structured practice, deliver feedback, and provide visual and auditory learning aids, along with simplifying complex content. Notably, learners with communication-related impairments expressed stronger approval of ChatGPT's role in simplifying instructional materials and supplying multimodal support.

In another study, Abduljawad (2024) examined the impact of ChatGPT an emerging AI-based language tool on the writing performance of Saudi university students studying English as a second language. Utilizing a mixed-methods design, the research gathered quantitative data from 130 students and qualitative insights from a focus group of six participants. The results indicated a significant improvement in students' writing proficiency. Participants highlighted several advantages of using ChatGPT, including personalized corrective

feedback, enhanced linguistic competence, expanded vocabulary knowledge, and increased learner autonomy. Overall, the study concluded that ChatGPT plays a substantial role in strengthening students' writing instruction and outcomes.

In Saudi context there are studies but there is a strong requirement to carry out a study which explains the quantitative and qualitative perspectives of the learners regarding AI.

3. Methods

3.1. Instruments

A concurrent embedded mixed-methods design was adopted to examine Saudi EFL learners' perceptions and practices regarding AI-based vocabulary learning. The quantitative component served as the primary strand and consisted of a structured questionnaire measuring students' attitudes and behaviours. Embedded qualitative items invited participants to describe their experiences, thereby complementing and enriching the quantitative results. As Brown [38] emphasizes, open-ended questions provide access to participants' emic perspectives, generating deeper and more nuanced insights.

Two instruments were employed. The first comprised eight Likert-scale items (1 = never, 5 = always) evaluating students' actual use of AI for vocabulary learning. Expert reviewers ensured content validity and alignment with the study objectives. This section demonstrated high internal reliability, with a Cronbach's alpha of 0.94.

The second instrument consisted of 15 Likert-scale statements assessing students' perceptions of AI tools, including perceived usefulness, ease of use, motivational value, and comparison to traditional learning. This section exhibited excellent reliability (original $\alpha = 0.93$; present study $\alpha = 0.95$).

3.2. Variables of the Research

Some important variables were found in this study. The independent one was AI technologies and students' Use and vocabulary learning was dependent upon it. Furthermore, there are some important moderators which were managed to maintain the validity and reliability of the study. The behaviour of the teacher, the level of the students, the nationality of the students, classroom settings and English level all were made identical, catered and

managed to elevate the validity and reliability of this investigation.

3.3. Data Collection and Analysis

A total of 220 students received the questionnaire via Google Forms, and 200 completed it, constituting an adequate sample size. Quantitative data were analysed using IBM SPSS Statistics (Version 28). Descriptive statistics (means and standard deviations) were computed for both the perception and practice domains. Spearman's correlation analysis was used to examine the relationship between perceptions and practices.

Qualitative responses were subjected to thematic analysis through manual coding, allowing recurrent themes and concerns to emerge. Quantitative and qualitative results were analysed separately and then integrated during interpretation to enhance the depth and explanatory power of findings.

3.3. Participants

Participants were EFL students from the English language centre of a public university in Saudi Arabia. Random sampling resulted in 200 completed questionnaires. Table 1 summarizes the demographic data.

Table 1: Demographic Profile of Participants.

Variable	Category	Frequency	Percentage
Gender	Male	100	50%
	Female	100	50%
Age	18-20	112	64%
	21-23	88	36%
Study Level	Level 1	41	18%
	Level 2	60	26%
	Level 3	99	56%

4. RESULTS

4.1. Quantitative Findings: Perceptions of AI-Based Vocabulary Learning

The first research question examined students' perceptions of using AI tools for vocabulary development. Higher scores indicate more positive perceptions. As shown in Table 2, the overall mean score was 4.19, suggesting that participants generally held favourable views toward AI-based vocabulary learning.

Table 2: Perception Scores for AI-Based Vocabulary Learning.

Item	Mean	SD
AI enhances my vocabulary learning effectively.	4.15	0.29
AI offers advantages over traditional methods (speed, personalization, retention).	4.15	0.22
AI methods are more effective than conventional vocabulary instruction.	4.16	0.20
Using AI for vocabulary is engaging.	4.17	0.27
I fully trust AI-generated vocabulary suggestions.	3.84	0.26
AI tools expand my English vocabulary.	4.19	0.21
I am motivated to use AI to learn new vocabulary.	4.20	0.23
AI offers more options for learning vocabulary.	4.16	0.25
AI enhances my understanding of unfamiliar words.	4.28	0.29
AI exercises are easy to understand.	4.13	0.20
I seldom face challenges when using AI for vocabulary learning.	4.10	0.22
I feel comfortable using AI tools.	4.17	0.21
AI tools are simple to operate.	4.19	0.29
AI accelerates vocabulary learning.	4.18	0.28
I plan to continue using AI tools for vocabulary learning.	4.22	0.12
Total Mean	4.19	0.20

4.2. Students' Use of AI Tools for Vocabulary Learning

Table 3 illustrates students' patterns of AI usage,

with an overall mean of 4.36. This is a crystal example of the use of AI tools for the acquisition of vocabulary. Students also commonly used AI to learn new words and verify spelling accuracy.

Table 3: AI Usage for Vocabulary Learning.

Item	Mean	SD
I use AI to learn unfamiliar vocabulary.	4.19	1.22
I use AI to translate individual words.	4.24	1.25
I use AI to translate both words and phrases.	4.35	1.21
I use AI for spelling correction.	4.26	1.28
I use AI to improve pronunciation.	4.20	1.21
I use AI to check word usage in context.	4.33	1.27
I use AI to identify parts of speech.	4.21	1.22
I use AI to learn synonyms and antonyms.	4.32	1.23
Total Mean	4.36	1.23

4.3. Correlation Between Perceptions and Practices

Spearman's correlation analysis revealed a statistically significant positive correlation between perceptions and practices ($r = 0.221$, $p < 0.01$), suggesting that students with more favourable attitudes toward AI tend to use AI tools more frequently for vocabulary learning.

Table 4: Correlation Between Perceptions and Practices.

Variable	Correlation (Spearman's rho)	Sig.	N
Perceptions × Practices	0.221	0.001	200

4.4. Qualitative Findings: Perceived Benefits of AI Vocabulary Tools

Qualitative responses revealed mostly positive experiences with AI-based vocabulary learning. As shown in Table 5, the most frequently mentioned advantage was real-time feedback (25%), followed by personalized learning (23%), interactive engagement (22%), increased motivation (14%), and convenience/flexibility (16%).

Students highlighted that immediate feedback helped them correct mistakes at the moment of learning. Several learners likened AI tools to having a readily available personal tutor. Others appreciated adaptive content tailored to their proficiency level, and many emphasized that interactive AI platforms, including conversational agents and gamified environments, enhanced their engagement and motivation.

Table 5: Thematic Analysis of Benefits.

Theme	Frequency	Percentage
Real-time feedback	42	25%
Personalized learning	37	24%
Interactive engagement	40	22%
Enhanced motivation	26	14%
Convenience and flexibility	31	16%

4.5. Challenges in Using AI Tools for Vocabulary Learning

Participants also identified a number of challenges, summarized in Table 6. Technical issues

were the most common (25%). Students cited unstable internet connections and outdated devices as significant obstacles. A lack of human interaction (25%) was also widely mentioned; many students emphasized that AI cannot replicate the empathy, emotional support, and nuanced feedback provided by human teachers.

Additional concerns included limited cultural and linguistic contextualization (19%), data privacy risks (16%), and occasional inaccuracies or biases in AI responses (15%).

Table 6: Thematic Analysis of Challenges.

Theme	Frequency	Percentage
Technical challenges	48	25%
Lack of human interaction	41	25%
Insufficient cultural/linguistic context	34	19%
Data privacy and ethical concerns	29	16%
Inaccuracies and bias in AI output	26	15%

4.6. Discussion

This study investigated Saudi EFL learners' perceptions, usage patterns, and challenges related to AI tools for vocabulary development. The quantitative results indicated highly positive perceptions of AI-assisted vocabulary learning, consistent with Alzahrani and Saleh (2025) who similarly found that AI improved learners' vocabulary proficiency. Students felt comfortable using AI and believed it enhanced vocabulary learning more effectively than traditional instructional methods.

Participants used AI tools extensively to translate words and phrases, learn synonyms and antonyms, acquire new vocabulary, and check spelling all of which support fundamental skills crucial for EFL learners. This heavy reliance on AI corresponds with previous findings showing that EFL learners commonly use AI for vocabulary comprehension and pronunciation support (Hago Elmahdi, Allehyani, & AbdAlgane, 2025). The positive correlation between perceptions and practices further confirms the Technology Acceptance Model (TAM), which posits that perceived usefulness and perceived ease of use significantly shape technology adoption [Jiang, Li & Gan, 2025].

Qualitative findings reinforced the quantitative

data. Real-time feedback emerged as a key advantage, allowing learners to identify and correct errors instantly, mirroring results from (Ali et al., 2023) Interactive features such as quizzes, chat-based tutoring, and contextualized exercises enhanced engagement and motivation. These outcomes align with interactionist theories of second-language acquisition, which emphasize meaningful interaction and timely feedback (Ali et al., 2024).

Personalization and flexibility were also seen as strong advantages. AI tools enabled learners to practice vocabulary at any time and in settings beyond the classroom. Similar to findings by Alqaed, M. A. (2024) and Al et al (2025) where students appreciated AI's adaptive capabilities and accessibility.

However, several challenges were reported. Technical issues were the most prevalent, corroborating (Alharbi & Hassan Al-Ahdal, 2025). Students also expressed concern about the lack of human guidance, noting that AI cannot substitute the emotional support and cultural insight of human teachers. Issues related to accuracy and bias, particularly with pronunciation and context-specific usage, reflect concerns raised by other researchers (Alsaawi, 2025; Mohamed, 2024). These challenges highlight the need for improved infrastructure, training, and ethical frameworks to guide AI integration in educational settings.

5. CONCLUSION

This study revealed that Saudi EFL learners possess generally positive perceptions of AI tools for vocabulary acquisition and frequently use these tools for translation, synonym/antonym learning, new vocabulary exploration, and spelling verification. A positive association was observed between students' perceptions and their usage patterns, indicating that favourable attitudes encourage greater engagement with AI.

AI offers numerous benefits personalization, immediate feedback, flexibility, interactivity, and enhanced motivation. Nonetheless, significant challenges remain, including technical limitations, reduced human interaction, limited cultural contextualization, data privacy concerns, and issues related to accuracy and bias.

For effective AI integration in Saudi EFL contexts, educational policymakers should ensure ethical implementation, equitable access to technology, and adequate learner training. Given that many first-year university students lack prior experience with AI tools, structured orientation programs are essential. Because this study focused on one public university,

future research should include students from additional educational settings public and private to strengthen generalizability. Future studies may also examine variables such as academic level, gender, and AI-related anxiety, as well as explore AI's impact on other language skills such as listening and reading.

5.1. Pedagogical Implications

The findings offer several implications for language educators and curriculum developers. First, the positive perceptions and frequent use of AI tools among Saudi EFL learners highlight the need for integrating AI-based applications into vocabulary instruction. Teachers can harness AI platforms to provide individualized vocabulary practice, real-time corrective feedback, and interactive learning experiences that accommodate diverse learner needs and proficiency levels. Furthermore, given the challenges students reported particularly those related to accuracy, cultural relevance, and reduced interpersonal interaction instructors should adopt a blended approach that combines AI-assisted learning with teacher-guided clarification, contextual explanation, and affective support. Training teachers to critically evaluate AI output and scaffold students' responsible use of such tools is essential. Finally, institutions should establish structured orientation programs that develop students' digital literacy, ensuring they can effectively employ AI resources for autonomous vocabulary learning.

5.2. Limitations of the Study

Although this study offers valuable insights into the perceptions and practices of Saudi EFL students regarding AI-supported vocabulary learning, several limitations should be acknowledged. The sample was restricted to students from a single public university, which may limit the generalizability of the findings to other regions or educational settings in Saudi Arabia. Additionally, the reliance on self-reported data may introduce response bias, as students' reported practices may not fully reflect their actual behaviour. The study also focused exclusively on vocabulary learning, excluding other language skills that may interact with or influence learners' attitudes toward AI tools. Finally, the research did not examine demographic or psychological variables such as gender, academic level, digital competence, or AI-related anxiety that may shape learners' perceptions and usage patterns.

5.3. Future Recommendations

To build on the insights provided in this study,

future research should expand the participant pool to include students from multiple universities, including private institutions, technical colleges, and secondary schools, to improve representativeness. Researchers may also investigate how demographic variables and learner characteristics influence perceptions of AI, such as prior technological experience, proficiency level, or anxiety related to AI usage. Further studies could adopt experimental or longitudinal designs to measure the long-term effects of AI tools on vocabulary retention and transfer.

Moreover, future work should explore the application of AI across other linguistic domains such as grammar, listening comprehension, reading strategies, and speaking fluency to provide a more comprehensive understanding of AI's pedagogical potential. Finally, qualitative investigations that capture in-depth learner and teacher experiences can offer richer insights into the cognitive, emotional, and cultural dimensions of AI-enhanced language learning.

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REFERENCES

- AbuSahyon, A. S. A. E., Alshorman, O., & Al-Absi, B. (2023). Investigating the impact of AI-driven chatbots on the acquisition of English as a foreign language among Saudi undergraduate students. *International Journal of Membrane Science and Technology*, 10(2), 3075-3088.
- Aldowsari, B. I., & Aljebreen, S. G. (2024). The impact of using a ChatGPT-based application to enhance Saudi students' EFL vocabulary learning. *International Journal of Language and Literary Studies*, 6(4), 380-397.
- Alhalangy, A., & AbdAlgane, M. (2023). Exploring the impact of AI on the EFL context: A case study of Saudi universities. Alhalangy, AGI, AbdAlgane, M.(2023). Exploring The Impact Of AI On The EFL Context: A Case Study Of Saudi Universities. *Journal of Intercultural Communication*, 23(2), 41-49.
- Alharbi, M. A., & Hassan Al-Ahdal, A. A. M. (2025). Exploring Saudi EFL Learners' Engagement with ChatGPT: A Mixed-Methods Study of Perceptions, Attitudes, and Intentions. *Sage Open*, 15(4), 21582440251392080.
- Ali, Y. A., Ali, M. M., Alharbi, W., Hamid, S., & Abbas, S. (2025). The Influence of ChatGPT on English Grammar Among Saudi ESL Learners. *Arab World English Journal*, 16.
- Ali, Y. A., Ali, M. M., Khan, R., Khan, Z., & Habib, A. (2024). The use of Realia in Saudi English language classroom. *Pegem Journal of Education and Instruction*, 14(4), 548-559.
- Ali, Y. A., Alotaibi, M. M. A. A. M., & Mohammed, S. (2023). Exploring Saudi ESL Students' Perceptions of ChatGPT as a Generative AI Tool for Language Instruction. *Pegem Journal of Education and Instruction*, 13(3), 557-574.
- Alqaed, M. A. (2024). AI IN ENGLISH LANGUAGE LEARNING: SAUDI LEARNERS' PERSPECTIVES AND USAGE. *Advanced Education*, 125-142.
- Alsaawi, A. (2025). Challenges and Opportunities Associated with AI Chatbots in Language Learning from the Perspective of Users in Saudi Arabia. *International Journal of Learning, Teaching and Educational Research*, 24(5), 400-415.
- Alzahrani, A., & Saleh, A. M. (2025). The Role of Language Learning Technologies: Insights from the Saudi Context. In *Language Education in Saudi Arabia: Integrating Technology in the Classroom* (pp. 129-145). Cham: Springer Nature Switzerland.
- Asif, M., & Sarwar, F. (2025). The essential position of trust in the technology acceptance model: a comprehensive review and bibliometric analysis in management studies. *Journal of Modelling in Management*.
- Elmahdi, O. E. H., Balla, A. A. S., Abdelrady, A. H., Osman, E., & Ahmed, A. O. A. (2025). AI-Driven Vocabulary Acquisition in EFL Higher Education: Interdisciplinary Insights into Technological Innovation, Ethical Challenges, and Equitable Access.
- Hago Elmahdi, O. E., Allehyani, F. S., & AbdAlgane, M. (2025). Exploring the Ethical Implications and Cultural Considerations in Using AI Technologies for EFL Education in the Saudi Context. *Nsukka Journal of the Humanities*, 33(2).
- Jiang, S., Li, H., & Gan, D. (2025). Technology acceptance model for online education: identifying interdisciplinary topics and their evolution based on BERTopic model. *Social Sciences & Humanities Open*, 12, 101831.

- Jomaa, N., Attamimi, R., & Al Mahri, M. (2024). Utilising artificial intelligence (AI) in vocabulary learning by EFL Omani students: The effect of age, gender, and level of study. In *Forum for Linguistic Studies* (Vol. 6, No. 5, pp. 171-186).
- Li, D., & Zhao, Y. (2025). Artificial Intelligence Applications for Oral Communication Skills in EFL Contexts: A Systematic Review: Li and Zhao. *The Asia-Pacific Education Researcher*, 1-12.
- Mohamed, A. M. (2024). Exploring the potential of an AI-based Chatbot (ChatGPT) in enhancing English as a Foreign Language (EFL) teaching: perceptions of EFL Faculty Members. *Education and Information Technologies*, 29(3), 3195-3217.
- Ozili, P. K. (2025). Technology impact model: a transition from the technology acceptance model. *AI & SOCIETY*, 40(2), 1-3.
- Wei, L. (2023). Artificial intelligence in language instruction: impact on English learning achievement, L2 motivation, and self-regulated learning. *Frontiers in psychology*, 14, 1261955.