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| RESEARCH ARTICLE

A Systematic Self-Review of Studies on EFL Vocabulary: Teaching, Assessment, Learning Outcomes, and AI Translation Quality

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| ABSTRACT

This study presents a systematic self review (SR) of the author's research on vocabulary teaching and learning published between 2006 and 2025. The corpus comprises forty three studies organized into five thematic clusters: (i) what vocabulary teaching and learning entail; (ii) the integration of technology (mind mapping, online tasks, web based learning, mobile applications, and YouTube videos) into vocabulary instruction; (iii) vocabulary assessment; (iv) vocabulary learning outcomes, with a focus on learners' difficulties in acquiring and translating lexical features such as phoneme–grapheme correspondences, morphological patterns, pronunciation, plurals, polysemes, collocations, pronouns, and technical terms; and (v) the use of AI tools for transliterating and translating terminology. Across these clusters, findings show that vocabulary development is a multi component process shaped by phonological, morphological, semantic, and contextual factors. Effective instruction consistently emphasizes lexical associations, structured scaffolding, and multimodal input, while technology enhances learning only when aligned with sound pedagogical principles. Studies on vocabulary assessment demonstrate that reliable evaluation requires multi level tasks capable of capturing both the breadth and depth of vocabulary knowledge, moving toward a more comprehensive performance based measures. Studies on learner difficulties and translation errors reveal persistent challenges with phoneme–grapheme correspondences, morphological complexity, pronunciation accuracy, collocational competence, and the interpretation of plurals and polysemes. A strong tendency toward literal translation was noted to be a recurring pattern, particularly when learners encounter unfamiliar lexical or cultural features. Studies on AI assisted transliteration and translation further highlight the limitations of current systems in handling specialized terminology, morphological variation, and context dependent meanings. Collectively, the findings underscore the need for pedagogical designs that foster lexical depth rather than surface memorization, and for integrated approaches that connect teaching, assessment, and translation training. The significance of this SR lies in its comprehensive synthesis of a large, thematically diverse corpus produced over twenty years by a single researcher. By mapping the evolution of vocabulary related scholarship across instructional, technological, assessment based, and translational dimensions, this SR provides a coherent framework that advances understanding of how vocabulary is acquired and operationalized in EFL contexts. It also offers a consolidated foundation for future research, curriculum development, and instructional innovation in vocabulary studies.

| KEYWORDS

Systematic review (SR), Author Bounded Systematic Review, Al-Jarf research program, vocabulary association, EFL vocabulary instruction, EFL vocabulary learning, EFL vocabulary assessment, EFL vocabulary learning outcomes, AI terminology translation.

| ARTICLE INFORMATION

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1. Introduction

Vocabulary acquisition[1] is the process of learning new words, understanding their meanings, and using them appropriately in communication. It involves integrating lexical items into one's mental lexicon to enhance comprehension and expression. As a

[1] https://www.pathstoliteracy.org/braille-brain-best-practices-vocabulary-acquisition-and-use/

lifelong and multidimensional process, vocabulary learning encompasses both receptive knowledge (understanding words during listening and reading) and productive knowledge (using words accurately in speaking and writing). A strong vocabulary base supports all language skills—listening, speaking, reading, and writing—which are essential for academic achievement and cognitive development.

According to Nation (2001) and Zheng (2024), vocabulary knowledge entails a multifaceted understanding of words. It includes knowledge of form (pronunciation, spelling, and morphological structure such as prefixes, roots, and suffixes); knowledge of conceptual meaning, semantic nuances, synonymy, antonymy, hyponymy, and part–whole relations and knowledge of grammatical use, position in constructions, frequency and appropriateness, and typical collocations. It also involves associative networks that link the word to related concepts, as well as the ability to retrieve and use the word accurately in real communication.

Vocabulary teaching and learning draws on a wide range of pedagogical techniques:[2] These include *contextual Learning* in which the meanings of words are inferred from the semantic and syntactic cues; *explicit Instruction* such as using flashcards, word lists, or studying synonyms/antonyms to build academic vocabulary; *multimodal exposure,* such as learning new words through listening to podcasts, reading books, or watching videos); *morphological analysis* which involves breaking complex words down complex words into prefixes, roots, and suffixes to determine meaning and *spaced repetition* where apps or games are used to review new vocabulary at increasing intervals.

Due to the significance of vocabulary teaching and learning in EFL, a substantial body of research, including numerous systematic reviews (SRs) and meta-analyses (MAs), has examined vocabulary instruction across diverse contexts such as education, technology, business, and communication. The literature revealed several thematic strands. General vocabulary learning SRs have synthesized theories, trends and instructional approaches, including SRs on teaching academic vocabulary in graduate writing courses (Ma, 2015); vocabulary learning research in ESL/EFL (Radzuan & Arif, 2025); vocabulary instruction for English learners (Zeng et al., 2025; Qureshi, A., et al., 2023); what works and what does not in EFL vocabulary instruction (Moustaghfir, 2026); vocabulary in English language learning, teaching, and testing in Vietnam (Vu, & Peters, 2021); and vocabulary acquisition and vocabulary size testing in second language learning (Al Quasmi, 2020).

Vocabulary learning by children and primary-school learners was examined by some SRs on EFL vocabulary learning activities for primary school students (Liu & Reynolds, 2025); pupils' perceptions of Quizlet for improving vocabulary skills (Tanabalan & Hashim, 2023) and vocabulary acquisition processes in young EFL learners (Nguyen Hoang, 2026).

Others SRs examined vocabulary combined with additional language skills such as the interplay between vocabulary and grammar in L2 reading comprehension (Asne & Estremera, 2025; Choi & Zhang, 2021); the integration of vocabulary and speaking skills through platforms like TikTok (Da Silva Pereira & Hitotuzi, 2023); EFL research on the impact of reading comprehension on students' vocabulary retention, and the relation between reading and vocabulary size (Binhomran & Altalhab, 2023); reading interest strength and vocabulary acquisition of EFL learners (Santi, Kholipa & Putri, 2021); and the impact of L1 and L2 glosses on EFL learners' incidental vocabulary learning through reading (Yeou, M., & Zyad, H. (2024).

A large number of SRs addressed general and specific vocabulary learning strategies. These include SRs on L2 vocabulary learning and teaching strategies used (Wen & Naim, 2023; Chiew & Ismail, 2021; Jaikrishnan & Ismail, 2021; Wei & Attan, 2013); kinesthetic strategies for vocabulary acquisition and retention (Hamdan & Aziz, 2026); pictorial-based vocabulary learning models (Hamsan et al., 2023); explicit vocabulary instruction during COVID-19 (Khalid, 2021); learning English vocabulary from word cards (Lei & Reynolds, 2022); seamless vocabulary learning across contexts (Song & Hwang, 2022); flashcard-based instruction in enhancing English vocabulary mastery among EFL Learners (Ilmah, S., et al., 2026); contextual guessing and dictionary use by Saudi EFL students (Ishtiaq, M., et al., 2025); intentional vocabulary acquisition for Asian EFL learners (Jonathans, P., et al., 2021); task-based language teaching in vocabulary acquisition and retention in EFL (Hamama & Brigui, 2026); and llanguage learning approaches and vocabulary mastery in EFL learners (Hidayad, F., et al, 2024).

The integration of a variety of technologies in vocabulary instruction was the focus of a significant number of SRs in the literature. For example, several SRs focused on game-based and gamified vocabulary learning (Vnucko & Klimova, 2023); game-enhanced vocabulary acquisition strategies (Yudintseva, 2015); gamification in vocabulary learning (Zainal, 2023); competitive digital gamification in ESL adult classrooms (Ameen, 2026); educational games for children with learning disabilities learning vocabulary (Mohamed & Shaaban, 2021); vocabulary learning in AR and VR gamification context (Haoming & Wei,

[2] https://study.com/academy/lesson/video/vocabulary-acquisition-processes-examples.html

2024); cognitive approaches, multimedia input, learning materials, and game elements of vocabulary learning apps (Wang, et al., 2021); and game and song Integration as vocabulary learning tools (Sitompul, et al., 2025).

Mobile-assisted vocabulary learning (MALL) was addressed by SRs on theories, pedagogies and vocabulary learning tasks of English vocabulary learning apps (Li, 2024); mobile-assisted vocabulary learning in ESL/EFL and learning research (Nawaz et al., 2025; Okumuş Dağdeler, 2023); vocabulary CALL for young ESL/EFL learners (Handley, 2014); mobile-assisted platforms for vocabulary learning (Ji & Aziz, 2021; Sabiri et al., 2024); vocabulary learning-designed MALL applications (Alhuwaydi, 2022); and cake application for vocabulary mastery (Putri et al., 2023).

Broader technology-enhanced vocabulary learning SRs included the following types: technology integration in ESL vocabulary instruction (Sarip & Khalid, 2021); theoretical trends in technology and L2 vocabulary learning (Yang et al., 2021); YouTube for enhancing EFL students' motivation (Ardianti & Chabibah, 2025); Quizizz and EFL students' vocabulary mastery in the pandemic to post-pandemic (Rizkiawati, et al., 2024); technology-assisted and technology-enhanced, computer-based, blended vocabulary learning (Simonnet et al., 2025; Zhou et al., 2024; Regina, 2022; Qiu, et al. 2022); vocabulary development through social media platforms (Alharthi et al., 2020); virtual reality applications (Alhawsawi & Alzaid, 2025); captioned and subtitled video (Reynolds et al., 2022); and Duolingo (Rouabhia & Kheder, 2024).

Additionally, AI-supported vocabulary learning has been synthesized in a recent SR by Yang (2025). Other SRs included Artificial Intelligence in vocabulary instruction within EFL contexts (Yilmaz, 2025); and the role and impact of AI-driven feedback models and applications in EFL vocabulary learning and retention (Khan, R., et al., 2025).

The above literature review shows a substantial body of SRs that examined vocabulary learning from multiple angles, including general instructional trends, young learners, vocabulary learning strategies, skill-integration, game-based and mobile-assisted learning, and technology-enhanced approaches. However, these SRs remain fragmented across isolated themes. Each strand focuses on a specific tool, population, or instructional technique, but no review provides an integrated synthesis that connects these strands to explain how vocabulary instruction is actually designed, implemented, and supported across platforms, contexts, and learner groups. Current SRs tend to describe technologies (games, MALL, VR, AI, Quizlet) or strategies in isolation, without examining the instructional mechanisms, pedagogical rationales, or cross-contextual patterns that shape effective vocabulary learning. As a result, there is no comprehensive, cross-platform synthesis that unifies the diverse evidence base into a coherent understanding of what works, for whom, and under what instructional conditions.

To fill this gap, the current study aims to conduct a comprehensive SR of the author's own studies on vocabulary teaching, learning, assessment, and technologies used in vocabulary instruction in the EFL college context in Saudi Arabia. It aims to answer the following question: What themes, instructional approaches, and technological tools emerge from the author's research studies on vocabulary teaching and learning published between 2006 and 2025? Drawing on a corpus of 43 empirical and conceptual studies published between 2006-2025, this SR aims to reveal coherent patterns, developmental trajectories, and pedagogical implications that are not visible when the studies are viewed in isolation.

This study is significant because it provides the first SR and longitudinal synthesis of the author's two decades of research on vocabulary teaching and learning, offering a coherent account of how these studies collectively contribute to ESL/EFL pedagogy. By integrating 43 publications produced between 2006 and 2025, this SR highlights recurring instructional principles and uncovers the evolution of vocabulary-learning innovations across traditional, digital, and technology-enhanced contexts. This SR not only consolidates the author's contributions into a unified evidence base but also identifies the pedagogical patterns, methodological consistencies, and theoretical insights that have shaped the field. As such, the study provides researchers, teachers, and curriculum designers with a comprehensive understanding of how vocabulary instruction can be effectively conceptualized and implemented across diverse learning environments.

Finally, this SR is significant because it is part of a broader series of SR/MA projects by the author, that has so far cover the following: teaching English for art education purposes to Ph.D. students (Al-Jarf, 2026a); EFL reading instruction: themes, methods, and pedagogical insights (Al-Jarf, 2026b); diverse educational evaluation domains (Al-Jarf, 2026c); students' errors in English–Arabic and Arabic–English translation (Al-Jarf, 2026d); students' errors in English–Arabic and Arabic–English translation (Al-Jarf, 2026e); mobile apps for developing multiple language skills in EFL (Al-Jarf, 2026f); adult reading practices, interests, habits and challenges (Al-Jarf, 2026g); pronunciation instruction and practice in L2 (2005–2025) (Al-Jarf, 2026h); teaching reading in Arabic to grades 1–12: textbooks, skills, and learning outcomes (Al-Jarf, 2026i); electronic searching studies (2002–2021) (Al-Jarf, 2026j); specific-skill assessment (Al-Jarf, 2026k); Arabic–English transliteration of personal names and public signages (Al-Jarf, 2026l); children's language acquisition and development in Saudi Arabia (Al-Jarf, 2026m); classroom practices, writing enhancement and creativity among EFL struggling students (Al-Jarf, 2026n); collaborative learning and teaching in digital

environments (Al-Jarf, 2026o); distance learning in the COVID-19 era and beyond: a multi-dimensional review of teaching, learning, assessment, infrastructure and crisis management (Al-Jarf, 2026p); effectiveness of mind-mapping on multiple English language skills in the Saudi context (Al-Jarf, 2026q); inadequate staffing and large class sizes in Saudi EFL and translation programs (Al-Jarf, 2026r); innovative word formation and pluralization processes in Arabic (Al-Jarf, 2026s); online videos and podcasts for language learning in the Saudi context (Al-Jarf, 2026t); 2024–2025 studies on AI Arabic translation, linguistics and pedagogy (Al-Jarf, 2026t); three decades of ESP innovation (Al-Jarf, 2026u); implementation, use, infrastructure, and success factors in LMS-supported EFL Instruction (Al-Jarf, 2026v); an author-bounded SR of studies on social media in EFL teaching and learning (2008–2025): skills, platforms, and pedagogical insights (Al-Jarf, 2026).

2. Methodology

1.1 Study Clusters

The 43 studies included in this SR were organized into five thematic clusters that reflect the major strands of the author's research on vocabulary teaching and learning published between 2006 and 2025. Together, these clusters capture the conceptual, linguistic, technological, assessment-oriented, and translational dimensions of the author's scholarly contributions, offering a comprehensive map of how vocabulary knowledge is taught, learned, assessed, and operationalized in EFL contexts.

Cluster 1 — What Vocabulary Teaching and Learning Entail

This cluster comprises studies that articulate the core principles, cognitive processes, and pedagogical approaches underlying effective vocabulary instruction. These works emphasize building semantic networks, strengthening lexical associations, and developing conceptual depth as essential components of vocabulary learning. Studies include:

- *A multiple-associations approach to teaching technical terms in English for specific purposes courses (Al-Jarf, 2022a)*
- *Making connections in vocabulary instruction (Al-Jarf, 2006a)*

Cluster 2 — Integrating Technology in Vocabulary Instruction

This cluster encompasses studies that investigate how digital tools, online platforms, mobile applications, and multimedia resources can enhance vocabulary learning. The studies are grouped into four sub-themes:

(A) Mind Mapping for Vocabulary

- *A model for enhancing EFL freshman students' vocabulary with mind-mapping software (Al-Jarf, 2015a)*
- *Teaching Greek and Latin roots with mind-mapping software (Al-Jarf, 2011c)*
- *Teaching medical terminology with mind-mapping software (Al-Jarf, 2010c)*
- *Teaching spelling with mind-mapping software (Al-Jarf, 2011b)*

(B) Online Tasks and Web-based Learning

- *Online vocabulary tasks for engaging and motivating EFL College students in distance learning during the pandemic and post-pandemic (Al-Jarf, 2022e)*
- *Teaching vocabulary to EFL college students online (Al-Jarf, 2007)*

(C) Mobile Applications

- *Learning vocabulary in the app store (Al-Jarf, 2022d)*
- *Specialized dictionary mobile apps for students learning English for engineering, business and computer science (Al-Jarf, 2022g)*
- *Online English-Arabic specialized dictionaries (Al-Jarf, 2011)*

(D) YouTube Videos

- *YouTube videos as a resource for self-regulated pronunciation practice in EFL distance learning environments (Al-Jarf, 2022j).*

Cluster 3 — Vocabulary Assessment

This cluster includes studies that examine how vocabulary knowledge is evaluated, how assessment tools are designed, and how testing practices influence learning. The studies highlight the need for multi-level, association-based, and performance-oriented measures that capture both the breadth and depth of lexical knowledge. Studies include:

- *What teachers should know about vocabulary testing (Al-Jarf, 2015c)*
- *Testing multiple vocabulary associations for effective long-term learning (Al-Jarf, 2023f)*
- *Creating and sharing vocabulary iRubrics (Al-Jarf, 2012a)*
- *Standardized test preparation with mobile flashcard apps (Al-Jarf, 2021c)*

Cluster 4 — Vocabulary Learning Outcomes: Difficulties in Learning and Translating Lexical Features

This cluster brings together studies that investigate learners' challenges with lexical form, meaning, and use, both within English and in English–Arabic translation. The studies address phoneme–grapheme correspondences, morphological awareness, pronunciation accuracy, plural formation, polysemy, collocations, pronouns, and technical terminology. Sub-themes include:

(A) Phoneme-Grapheme Correspondences

- *EFL freshman students' difficulties with phoneme-grapheme relationships* ***(Al-Jarf, 2019a)***

(B) Morphological Difficulties

- *Freshman students' difficulties with English adjective-forming suffixes (Al-Jarf, 2019)*
- *Difficulties in learning English plural formation by EFL college students (Al-Jarf, 2022)*

(C) Pronunciation Problems

- *Student-interpreters' foreign proper noun pronunciation errors in English–Arabic and Arabic–English media discourse interpreting (Al-Jarf, 2022h)*
- *Proper noun pronunciation inaccuracies in English by educated Arabic speakers (Al-Jarf, 2022f)*
- *Splitting unsplittable foreign words in casual speech by EFL Arab learners (Al-Jarf, 2025k)*
- *Vowel pronunciation errors in English biomedical terminology by Arab healthcare professionals (Al-Jarf, 2025j)*
- *Mapping pronunciation errors in English silent consonants: A corpus-based study of Saudi EFL undergraduates (Al-Jarf, 2025j)*
- *Faulty consonant gemination in the pronunciation of English biomedical terms by Arab healthcare professionals (Al-Jarf, 2025h)*

(D) Translating Plurals

- *Issues in translating English and Arabic plurals (Al-Jarf, 2020)*

(E) Translating Polysemes

- *Challenges undergraduate student translators face in translating polysemes from English to Arabic and Arabic to English (Al-Jarf, 2022b)*

(F) Translating Collocations

- *Undergraduate student-translators' difficulties in translating English word + preposition collocations to Arabic (Al-Jarf, 2022i)*
- *Word + particle collocation errors in English–Arabic translation (Al-Jarf, 2009)*

(G) Translating Pronouns

- *Interlingual pronoun errors in English–Arabic translation (Al-Jarf, 2010)*

(H) Translating Technical Terms

- *translating English and Arabic common names of chemical compounds by student-translators in Saudi Arabia (Al-Jarf, 2022c)*
- *Translation students' difficulties with English Neologisms (Al-Jarf, 2010d)*

Cluster 5 — AI as a Tool for Transliterating and Translating Terminology

Since students use AI tools to translate texts, vocabulary items and terminology without knowing the accuracy and authenticity of AI translation, this cluster includes studies that evaluate how artificial intelligence tools ialized terms, formulaic expressions, culturally embedded items, and metaphorical uses of language. The studies compare AI outputs across platforms and assess their linguistic accuracy and pedagogical implications. Studies include:

- *Translation of Medical terms by AI: A comparative linguistic study of Microsoft Copilot and Google Translate (Al-Jarf, 2024d)*
- *Translation of English and Arabic "sleep" terms and formulaic expressions by Artificial Intelligence: A comparison of Copilot and DeepSeek (Al-Jarf, 2025i)*
- *DeepSeek, Google Translate and Copilot's Translation of Arabic grammatical terms used metaphorically (Al-Jarf, 2025f)*
- *AI translation of the Gaza-Israel war terminology (Al-Jarf, 2025b)*
- An investigation of Google's English-Arabic translation of technical terms *(Al-Jarf, 2021a)*
- *Human vs AI translation of common names of chemical compounds (Al-Jarf, 2025i)*

- *Translation of Arabic folk medical terms with om and Abu by AI: A comparison of Microsoft Copilot and DeepSeek (Al-Jarf, 2025h)*
- *Can Artificial Intelligence (AI) Translate Arabic abu-brand names with different prompts (Al-Jarf, 2025d)*
- *Copilot vs DeepSeek's translation of denotative and metonymic abu- and umm- animal and plant folk names in Arabic (Al-Jarf, 2025e)*
- *AI translation of full-text Arabic research articles: The case of educational polysemes (Al-Jarf, 2025a)*
- *Arabic transliteration of borrowed English nouns with /g/ by Artificial Intelligence (Al-Jarf, 2025c)*

Together, the five clusters provide an integrated overview of the author's two-decade research on vocabulary teaching and learning. Cluster 1 establishes the conceptual foundations of lexical development. Cluster 2 demonstrates how technology operationalizes these principles through mind-mapping, online tasks, mobile apps, and multimedia tools. Cluster 3 addresses how vocabulary knowledge is assessed through multi-level and association-based measures. Cluster 4 shifts focus on learner outcomes, documenting persistent difficulties with lexical form, meaning, use, and translation. Cluster 5 extends the analysis into AI-mediated translation, highlighting the potential and limitations of AI in handling terminology and culturally embedded lexical items. Collectively, these clusters form a coherent framework that traces how vocabulary is conceptualized, taught, supported, assessed, and manifested in learner performance.

2.2 Eligibility (Inclusion & Exclusion) Criteria

Studies were excluded if they met the following criteria:

- **Duplicate Publications:** versions of the same work existed (e.g., conference paper, journal article, book chapter). In such cases, only one version was retained and the others were excluded as duplicates such as: *DeepSeek, Google Translate and Copilot's translation of Arabic grammatical terms used metaphorically (Al-Jarf, 2025g); translation of medical terms by AI: A comparative linguistic study of Microsoft Copilot and Google Translate (Al-Jarf, 2024e); issues in translating English and Arabic plurals (Al-Jarf, 2019c); multiple equivalents to medical terms (Al-Jarf, 2017); issues in translating English technical terms to Arabic by Google Translate (Al-Jarf, 2016); online English-Arabic specialized dictionaries (Al-Jarf, 2015b); learning vocabulary in the app store (Al-Jarf, 2013); engaging and motivating students with online vocabulary tasks (Al-Jarf, 2012b); enhancing freshman students' vocabulary skills with mind-mapping software (Al-Jarf, 2010a); interlingual pronoun errors in English-Arabic translation (Al-Jarf, 2010b) ; acquisition of adjective forming suffixes by EFL freshman students ((Al-Jarf, 2008a); phonological and orthographic problems in EFL college spelling (Al-Jarf, 2008b); plural acquisition by EFL freshman college students (Al-Jarf, 2006b).*

- **Studies that do not directly address vocabulary instruction**, vocabulary learning, vocabulary knowledge, terminology, general pedagogy, educational technology, or language skills without a vocabulary component. Examples are: *multiple Arabic equivalents to English medical terms (Al-Jarf, 2018); pluralization of borrowed social media terminology in colloquial Arabic (Al-Jarf, 2023e); and the Gaza-Israel war terminology: Implications for translation pedagogy (Al-Jarf, 2024c).*

- **Studies on Lexical features in Arabic such as:** *peculiarities of The Progressive, Perfect and Future Formation in Colloquial Arabic (Al-Jarf, 2024b); derivation of Verbs from Loanwords in Arabic According to Arabic Derivational Paradigms (Al-Jarf, 2024a); clipping of borrowings in spoken Arabic (Al-Jarf, 2023a); derivation from native and loan acronyms in Arabic (Al-Jarf, 2023b); lexical hybridization in Arabic: The case of word formation with foreign affixes (Al-Jarf, 2023c); lexical Shortening and blending as an Innovative Word Formation Process in Arabic (Al-Jarf, 2023d); word Formation with Foreign Lexemes: The Case of Hybrid Compounds in Arabic (Al-Jarf, 2023h); Arabic word formation with borrowed affixes (Al Jarf, 2014)*

- **Spelling and Transliteration studies** (See Al-Jarf, 2026l).

- **Studies on personal, shop and hotel names as** *linguistic-cultural characteristics of hotel names in Makkah, Madinah and Riyadh hotels (Al-Jarf, 2021b) and the interchange of personal names in Muslim communities (Al-Jarf, 2023g).*

2.2 Corpus Characteristics

The final corpus consisted of 43 studies authored by Rima Al-Jarf between 2006 and 2025. Although produced across nearly two decades, the studies form a coherent and internally consistent research program centered on vocabulary teaching, vocabulary knowledge, and technology-enhanced lexical learning in the ESL/EFL college contexts. The corpus reflects a balanced integration of conceptual, linguistic, pedagogical, and technological perspectives, with studies addressing foundational principles of vocabulary instruction, specific aspects of lexical knowledge, digital tools for vocabulary learning, and vocabulary assessment practices. Thematically, the studies were organized into five thematic clusters: (1) principles of teaching vocabulary, (2) specific aspects of vocabulary knowledge, (3) integrating technology (mind-mapping, online tasks, and mobile applications) in vocabulary instruction; and (4) vocabulary assessment. Across these clusters, the studies share a consistent analytical orientation,

emphasize learner-centered instructional design, and employ comparable methodological approaches, including descriptive analyses, instructional models, and technology-mediated interventions. Collectively, the corpus represents a longitudinal, methodologically stable body of work that traces the evolution of the author's contributions to vocabulary pedagogy and highlights the interplay between linguistic insight, instructional innovation, and digital transformation in vocabulary learning.

2.3 Information Sources

Because this SR examines a closed, author-bounded corpus, the information sources were limited to the complete body of research published by Reima Al-Jarf between 2006 and 2025. All studies were retrieved from publicly accessible academic platforms that index the author's full scholarly output, including Google Scholar, ResearchGate, Semantic Scholar, Academia.edu, SSRN, ERIC, EBSCO, ProQuest, and institutional repositories. These platforms collectively provide comprehensive coverage of the author's publications across journals, conference proceedings, book chapters, and digital repositories. No external database search was required, as the aim of the review was not to identify global studies on vocabulary instruction, but to synthesize all vocabulary-related studies produced by a single researcher within a defined timeframe. All records were manually verified to ensure accuracy, remove duplicates, and confirm alignment with the inclusion criteria described in Section 2.2.

2.4 Data Extraction and Synthesis

Data were extracted manually using a structured template developed specifically for this author-bounded corpus. For each of the 43 studies, publication year, research purpose, instructional or linguistic focus, participant characteristics (when applicable), data collection procedures, data analysis techniques, and major findings were recorded. Extracted data were cross-checked for accuracy and consistency to ensure that all studies were classified according to comparable criteria.

Given the descriptive and heterogeneous nature of the studies, a qualitative synthesis approach was employed. Studies were compared within and across clusters to identify convergent themes, developmental patterns, and conceptual linkages. The synthesis emphasized longitudinal progression in the author's research program, highlighting how early work on vocabulary principles evolved into technology-enhanced instructional models and later into assessment-oriented investigations. Rather than aggregating numerical outcomes, the analysis traced how the studies collectively contributed to understanding vocabulary pedagogy, lexical knowledge, and digital innovation in ESL/EFL contexts. This integrative synthesis provided a coherent account of the scope and cumulative impact of the author's contributions over two decades.

2.5 PRISMA Flow Description

Because this SR is based on a closed, author-bounded corpus, the PRISMA flow (Preferred Reporting Items for SRs and MAs) reflects a streamlined and fully contained identification and screening process. All publications authored by Reima Al-Jarf between 2006 and 2025 were retrieved from academic platforms and institutional repositories, yielding an initial set of records representing the author's complete scholarly output during this period. After removing duplicate versions of the same study (e.g., conference papers and journal articles reporting identical findings), 43 unique records remained for screening. Titles and abstracts were examined to determine relevance to vocabulary teaching, vocabulary knowledge, or technology-enhanced vocabulary learning. Studies were excluded if they did not address vocabulary as a central focus, if they examined other language skills without a vocabulary component, if they focused on technology without lexical learning outcomes, or if they were non-empirical or non-scholarly pieces such as opinion articles or conceptual essays.

Full-text assessment was then conducted for the 43 studies to confirm eligibility based on the predefined inclusion criteria. All 43 studies met the criteria and were included in the final synthesis. The PRISMA flow therefore documents a linear and internally bounded progression from the identification of all publications within the author's research record, through relevance screening and eligibility assessment, to the final inclusion of studies that directly contribute to the five thematic clusters of the review. This process ensured that the resulting corpus was comprehensive, coherent, and methodologically aligned with the aims of the SR.

3. Results

2.3 Study Characteristics

Cluster 1 — What vocabulary teaching and learning entail (principles of teaching vocabulary)

A Multiple-Associations Approach to Teaching Technical Terms in ESP (Al-Jarf, 2022a)

Making Connections in Vocabulary Instruction (Al-Jarf, 2006a)

Both studies present an instructional model based on multiple lexical associations to enhance students' ability to learn, retain, and apply vocabulary and technical terminology. The approach emphasizes connecting the printed form of a word or technical term with its pronunciation—including hidden sounds, double and silent letters, and homophones—its part of speech, singular or plural form, synonyms and antonyms, English and Arabic meanings, usage patterns, component parts, and previously encountered related items. This multi-layered network of associations aims to deepen lexical understanding and strengthen long-term retention.

The instructional design in both studies highlights the importance of categorization, association, visualization, and mnemonic strategies. Mind maps are recommended as an effective tool for visually representing the relationships among lexical features. Students are also encouraged to engage in extensive reading and listening outside the classroom to reinforce exposure and consolidate learning. Assessment tasks and quizzes require students to actively construct the same associations emphasized during instruction, ensuring alignment between teaching and evaluation.

While the 2006 study focuses on general vocabulary taught in a 2000-word freshman course at the College of Languages and Translation, the 2022 study applies the same instructional principles to technical terms in business, computer science, and engineering. Despite the difference in lexical domain, both studies report significant gains in students' vocabulary knowledge and performance. Comparisons of pre- and post-test results, as well as experimental and control group scores, demonstrate that the multiple-associations approach is effective for both struggling learners and students handling specialized terminology.
Together, the two studies provide strong evidence that vocabulary learning improves when instruction systematically integrates phonological, morphological, semantic, and contextual associations, enabling learners to build richer lexical networks and transfer their knowledge across tasks and domains.

Cluster 2 — Integrating technology in vocabulary instruction

(A) Mind Mapping for Vocabulary

A Model for Enhancing EFL Freshman Students' Vocabulary with Mind-Mapping Software (Al-Jarf, 2015a)
Teaching Greek and Latin Roots with Mind-Mapping Software (Al-Jarf, 2011c)
Teaching Medical Terminology with Mind-Mapping Software (Al-Jarf, 2010c)
Teaching Spelling with Mind-Mapping Software (Al-Jarf, 2011b)

The four articles demonstrate how mind-mapping software can be used to help students combine, learn, retain, apply and relate general vocabulary, medical terminology sharing the same root/base, the same prefix or suffix, cognates, derivatives, singular and plural forms, words sharing the same spelling features and relate details which radiate out from the centre. They show how the mind-mapping software can be used to combine different prefixes and/or suffixes to the same root, different roots to the same prefix/and or same suffix, sorting out, classifying, grouping terms according to the prefixes, roots or suffixes they contain, and interpolating prefixes, roots and suffixes. By focusing on roots, prefixes, suffixes and derivatives and then looking for branches that radiate out and show connections between the terms, the students map medical terminology knowledge in a way which will help them understand and retain new medical terms. Comparisons of vocabulary pre and posttest scores of students in Al-Jarf (2015a) who used vocabulary mind-maps and those who did not, showed significant differences in vocabulary acquisition as revealed by the posttest. Students who used vocabulary mind-maps made higher gains in vocabulary acquisition and more accurate vocabulary knowledge.

(B) Online tasks and Web-based Learning

Online Vocabulary Tasks for Engaging and Motivating EFL College Students in Distance Learning During The Pandemic And Post-Pandemic (Al-Jarf, 2022e)

This study proposes a variety of online vocabulary tasks and technologies that vocabulary instructors can choose from, such as mobile-based applications viz Vocup, Quizlet, Quizizz, game-based mobile apps, Saving Alice, Duolingo, Kahoot, vocabulary flashcards, mobile audiobooks, collaborative mobile ebook reading; podcasts; online dictionaries; concordance-based glosses; picture viewing and picture drawing on tablets; videos; e-portfolios; teaching idioms via graphic novels; multimedia annotations; social networks; project-based learning and mind-maps. To engage, motivate and encourage student-student and student-instructor interaction in the distance learning environment, the study proposes using WhatsApp, ConnectYard, creating a community of inquiry and learning partnerships, collaborative writing exchange projects, student collaboration, social interaction, integrating text-chat and webcam, and utilizing technology-mediated task-based language teaching. Online vocabulary tasks can be performed individually, in pairs or in small groups; interactively or collaboratively; synchronously or asynchronously. Instructional phases and teacher and students' roles are also described.

Teaching Vocabulary To EFL College Students Online (Al-Jarf, 2007)

Two groups of students participated in the study. The control group used in-class instruction, whereas the experimental groups used textbook-based and online vocabulary instruction from home. Comparisons of the pre and posttest mean scores showed significant differences, indicating that online instruction affected vocabulary development. The posttest scores also correlated with the frequency of using the online course. Active participants made higher gains than inactive participants. It was concluded that use of technology from home and even as a supplement to traditional classroom instruction helps motivate and enhance EFL students' learning and acquisition of English vocabulary.

(C) Mobile Apps

Learning Vocabulary In The App Store (Al-Jarf, 2022d)

The study gives examples of vocabulary mobile Apps that can be downloaded from the App Store and used as extension activities or as a supplement to in-class vocabulary instruction in EFL such as English word study, advanced English vocabulary, test your English vocabulary, English vocabulary level I, II & III, and 1000 TOEFL words. There are also mobile dictionaries, graded vocabulary tests for assessing vocabulary knowledge and skills and vocabulary trainers for the TOEFL and IELTS. It gives guidelines for selecting and using vocabulary Apps, the phases of teaching with vocabulary Apps and the instructor's role. The instructor can help the students find and download relevant vocabulary Apps, give pre-questions, and follow up with the students to motivate them to use the apps. Surveys showed that the students enjoyed vocabulary Apps and found them useful.

Specialized Dictionary Mobile Apps for Students Learning English for Engineering, Business and Computer Science (Al-Jarf, 2022g)

This article shows ESP instructors examples of engineering, computer science and business (MDAs) available in the Google Play or Apple Stores; how specialized MDAs can be located; criteria for selecting specialized Mobile Dictionary Apps (MDAs); the lexicographical features of specialized MDA and instructional stages with MDAs. Instruction with MDAs goes through three stages: pre-task, task, and post-task phases. As a facilitator, the instructor helps the students find and download MDAs that meet their needs and purposes and match their proficiency level; gives pre-questions; and follows up to make sure they are using them.

Online English-Arabic Specialized Dictionaries (Al-Jarf, 2011a)

This study evaluated a sample of online Arabic-English-Arabic specialized dictionaries of the Arabization Center in Morocco, the Arabic Language Academy in Cairo, the Saudi Terminology Databank (BASM), School Arabia glossaries, Dictionary Bay, and Babylon. Results revealed several shortcomings of those online specialized dictionaries such as limited coverage, inaccuracy and the lack of inclusiveness of some meanings and slow up-dating. The study gave recommendations for improving the practicality and usefulness of online Arabic-English-Arabic specialized dictionaries to meet translation students' needs.

(D) YouTube videos

YouTube Videos As a Resource For Self-Regulated Pronunciation Practice in EFL Distance Learning Environments (Al-Jarf, 2022j)

This article proposes the use of YouTube videos to improve EFL students' pronunciation and shows how YouTube videos can be integrated in EFL instruction to teach pronunciation; the advantages of integrating YouTube videos (they are free, provide variety of topics, speakers, difficulty level, can be easily downloaded to the laptop or mobile phone and can be viewed anywhere and anytime); how to locate YouTube videos that target a specific pronunciation skill; criteria for selecting online videos (video length in minutes, topic familiarity, difficulty level, speed of the speakers, students' proficiency level, and students' interests); pronunciation subskills that can be developed through YouTube videos; and teaching and learning with YouTube videos before watching a video, while watching the video and after watching the video.

Cluster 3 — Vocabulary Assessment

Testing Multiple Vocabulary Associations for Effective Long-Term Learning (Al-Jarf, 2023f)

What Teachers Should Know About Vocabulary Testing (Al-Jarf, 2015c)

The two studies give comprehensive guidelines for planning and designing vocabulary tests. Key steps included identifying the skills to be assessed, outlining the course content, and preparing a table of specifications that links skills, topics, and question distribution. It provides examples of test instructions covering pronunciation, spelling, morphology, semantics, register, collocations, idioms, and pragmatic expressions. It specifies essential test-quality criteria such as clarity of instructions, coverage of classroom skills, inclusion of tasks at the phoneme/grapheme, word, phrase, sentence, and discourse levels, emphasizing higher-order thinking and production questions. They also emphasize that tests should be reliable, valid, have a discrimination power and balanced difficulty. Additional considerations include test duration, test length, format, layout, scoring procedures, feedback, and the use of test results for diagnosing weaknesses and planning remedial work.

Creating and Sharing Vocabulary iRubrics (Al-Jarf, 2012a)

iRubric is a comprehensive digital tool for designing analytic scoring rubrics for vocabulary courses by defining the skills, subskills, performance levels "Poor," "Fair," or "Good", and mark allocations. The study demonstrates how teachers can build, edit, apply, and share rubrics through the RCampus LMS, with scores automatically calculated and posted to the gradebook. It highlights the advantages of iRubric, including clearer performance criteria, alignment with learning outcomes, time-saving scoring procedures, secure access to scored rubrics, and opportunities for collaborative assessment through the RCampus rubric gallery. iRubrics are an effective tool for improving the reliability and validity of EFL vocabulary assessment.

Standardized Test Preparation With Mobile Flashcard Apps (Al-Jarf, 2021c)

In this study, mobile flashcard apps (FCAs) were examined as supplementary tools for preparing EFL college students for standardized tests such as the IELTS, TOEFL, TOEIC, GRE, and SAT. These free apps contain thousands of essential and specialized vocabulary items across diverse academic fields. They offer multiple learning modes (Study, Slide Show, Matching, Memorize, Quiz, and Play), customizable features such as starred words, and flexible browsing options. The study provides examples of FCAs, guidelines for locating and selecting appropriate apps, and a structured instructional model consisting of pre-task, task, and post-task phases. act as facilitators, instructors help students choose suitable apps, provide guiding questions, and monitor their progress. The study demonstrates that mobile flashcards are accessible, efficient tools that support faster vocabulary learning and enhance students' readiness for standardized tests

Cluster 4 — Vocabulary Learning outcomes: Difficulties in Learning and Translating Lexical Features

(A) Phoneme-Grapheme Correspondences

EFL Freshman Students' Difficulties with Phoneme-Grapheme Relationships (Al-Jarf, 2019a)

Thirty-six Saudi EFL freshmen students, at the College of Languages and Translation (COLT), King Saud University, took a listening-spelling test in which they filled out 100 blanks in a dialogue. Results indicated that 63% of the spelling errors were phonemic and 37% were graphemic. The subjects had more problems with whole words than graphemes and phonemes. Examples of phonemic problems that the students had were inability to hear and discriminate all or most of the phonemes in a word, inability to discriminate vowel phonemes and hear the final syllable or suffix. They mostly had graphemic problems with vowel digraphs, double consonants, silent vowels and consonants, and homophones. A simplification process seems to affect students' spelling errors.

(B) Morphological Difficulties

Freshman Students' Difficulties with English Adjective-Forming Suffixes (Al-Jarf, 2019)

Freshman students at the COLT received direct instruction in adjective-forming suffixes, and then they took an immediate and a delayed test. Error analysis showed that 36% of the responses were left blank or the subjects duplicated the stimulus word. In 32% they mismatched the word and suffix, in 36%, they made spelling mistakes; in 15% they spelled words phonetically, and in 15% they added a noun-or an adverb-forming suffix. Significant differences were found in the number of errors made by the students on both tests. The total number of errors made correlated with the students' vocabulary knowledge. A hierarchy of difficulty in attaching adjective-forming suffixes, faulty strategies used in adjective morphology and possible causes of students' difficulty in adjective suffix acquisition are given.

Difficulties in Learning English Plural Formation by EFL College Students (Al-Jarf, 2022)

The study examined EFL freshmen's difficulties in forming English plurals through immediate and delayed tests, yielding a corpus of 3,099 errors. Results showed no significant improvement over time, indicating persistent challenges. Students frequently overgeneralized regular plural morphemes, deleted plural endings in nouns ending in –s/–es, and misapplied plural markers in words without plural forms. They also struggled with Latin plurals, non-count nouns, and words whose plural and singular forms are identical. The most problematic categories included nouns ending in –s/–es with no singular form, Latin plurals, and non-count nouns. Interference among the English plural morphemes themselves and confusing plural formation rules caused most errors.

(C) Pronunciation Problems

Student-Interpreters' Foreign Proper Noun Pronunciation Errors in English–Arabic and Arabic–English Media Discourse Interpreting (Al-Jarf, 2022h)

A corpus of foreign Proper Noun pronunciation errors was collected from interpreting tests and class practice. Error analysis showed that student interpreters at COLT have difficulty identifying and discriminating one or more phonemes in foreign Proper Nouns, whether English or Arabic. They produced nonsense words that rhyme with the unfamiliar source words for unfamiliar Proper Nouns. Sound analogy was also used in producing equivalents to unfamiliar Proper Nouns. They deleted part of the Proper Noun and changed phonemes and substituted with a longer or shorter vowel, by another consonant or another syllable. The Arabic pronunciation was retained and overgeneralized. A vowel was inserted to break the consonant clusters. Most pronunciation errors are attributed to lack of knowledge of Proper Nouns commonly occurring in the media and how equivalent English and Arabic Proper Nouns are pronounced. Extra practice using online videos, podcasts, mobile apps, and TED Talks is needed in Liaison Interpreting instruction.

Proper Noun Pronunciation Inaccuracies in English By Educated Arabic Speakers (Al-Jarf, 2022f)

Analysis of a corpus of errors in pronouncing Proper Nouns used in English collected from the spontaneous speech of a sample of Arab informants showed that Arabic speakers mispronounce English vowels in *Google, Moodle, Uber, Nixon, London;* replacing consonants absent in L1 /p, v/ by their equivalents; geminating consonants in city and country names; inserting a vowel in

consonant clusters in Proper Nouns and acronyms; break words into two sub-words; pronounce words the way they are spelled and transfer Arabic stress rules to English words (McDonald). Pronunciation errors are attributed to transfer from Standard Arabic or the local dialect, insufficient mastery of English pronunciation rules, phone-grapheme correspondences and lack of knowledge of the differences between English and Arabic phonology. The study recommends watching pronunciation practice videos; raising students' awareness of English pronunciation rules, phonics, phoneme-grapheme correspondences, teaching contrastive phonology; providing graded lessons and remedial exercises.

Splitting Unsplittable Foreign Words in Casual Speech by EFL Arab Learners (Al-Jarf, 2025k)

A sample of 15 unsplittable foreign long words segmented by 74 Arab college students was analyzed. Results showed that Arab learners split words into two parts as in Skype > Sky + pe & Kaspersky > Kasper + sky. They treat unfamiliar long words as consisting of familiar parts and pronounce them as if they were two words, especially in the case of segments that resemble known English words. They reconstruct unfamiliar words using analogies from both English and Arabic. Their pattern of phonological segmentation is driven by both orthographic influence and phonotactic constraints in Arabic. Learners try to make sense of unfamiliar phonological forms using Arabic phonology, English orthography, and semantic associations. The study recommends phonetic awareness training, stress and rhythm drills, listening to native speakers and shadowing their pronunciation, pause, juncture and boundaries, metacognitive strategy training and contrastive analysis. A variety of technologies can be used in practice.

Mapping Pronunciation Errors in English Silent Consonants: A Corpus-Based Study of Saudi EFL Undergraduates (Al-Jarf, 2025j)

The study examined Saudi EFL undergraduates' mispronunciation of English silent consonants produced in spontaneous speech. Students frequently pronounced silent d, t, b, l, h, s, and n, producing forms such as *hanDsome*, *bomB*, *saLmon*, *Honor,*. In contrast, they rarely mispronounce silent k, w, gh, or g in words like *knee*, *knife*, *light*, likely because these patterns were learned as fixed exceptions or because pronouncing them would create clusters not allowed in Arabic phonotactics. Errors were attributed to negative transfer from Arabic, reliance on spelling, and limited exposure to native pronunciation. The study recommends explicit instruction in silent-letter patterns, phonological awareness activities, and the integration of digital pronunciation tools such as text-to-speech, videos, podcasts, and audiobooks.

Vowel Pronunciation Errors in English Biomedical Terminology by Arab Healthcare Professionals (Al-Jarf, 2025j)

The study investigated vowel pronunciation errors in English biomedical terms produced by Arab healthcare professionals. Analysis of mispronounced terms from spontaneous speech revealed that participants often pronounced y/i as /ai/ in words such as *acetyl*, *methyl*, *cervical*; overgeneralize vowel patterns from related words (*combine* > *combination*); and pronounced the suffix -gia in *neuralgia* and *metatarsalgia* as */dʒjə/* instead of */dʒə/*. They also lengthened final vowels in *aspirin*, *melatonin*, and *insulin*, and altered vowel quality in *Galvus*, *Omega*, and *Mobic*. They mispronounce eu in *Euthyrox* and *Eucarbon*, and reduce the triphthong in *diet* to */daɪt/*. These errors stem from orthographic influence, analogy with familiar biomedical terms, and phonological transfer from Arabic.

Faulty Consonant Gemination in the Pronunciation Of English Biomedical Terms by Arab Healthcare Professionals (Al-Jarf, 2025h)

The study examined Arab healthcare professionals' mispronunciation of geminated consonants in English biomedical terms. Data analysis showed frequent over-gemination of consonants such as /l, r, n, b, t, p/ in words like *penicillin*, *collagen*, and *millimeter*. Participants also geminated single final consonants in common words (*up*, *cut*, *shut*) due to L1 phonological transfer and reliance on spelling. In contrast, they did not geminate double letters in words such as *mammography* or *appendix*, where the morphological structure is less transparent. Errors were attributed to Arabic phonotactics, misinterpretation of English orthography, and limited exposure to native pronunciation. The study recommends explicit pronunciation instruction, phonological awareness training, and the integration of digital pronunciation tools.

(D) Translating Plurals

Issues In Translating English and Arabic Plurals (Al-Jarf, 2020)

The study investigated undergraduate students' difficulties in translating English and Arabic plurals. While students correctly translated plurals that matched across the two languages, they struggled with several plural types. Problematic cases included Arabic plurals with singular English equivalents (e.g., مجوهرات > jewellery), Arabic duals referring to two distinct entities (e.g., الرافدان > the Tigris and Euphrates), and multiple Arabic plurals such as دجاجات / دجاج. Students also had difficulty with stems that have two English plurals with different meanings (e.g., economics vs. economies), compound plurals (e.g., معالجات الصور > image processors), English nouns ending in -ies with identical singular and plural forms (series, species), and base forms that shift part of speech (rich > riches; wood > woods). Additional challenges involved Latin plurals such as indices, larvae, oases, and names of tools ending in -s (e.g., scissors, scales). Error analysis showed that students made more errors translating Arabic > English than

English > Arabic, with morphological issues dominating the Arabic–English test and semantic issues dominating the English–Arabic test. Literal translation was the most common strategy, and when meaning was unclear, students relied on phonological approximations, paraphrases, or unrelated equivalents. Bidirectional transfer occurred, with students applying plural patterns from the source language to the target language, regardless of whether the source was Arabic or English. Recommendations for improving plural translation instruction are provided.

(E) Translating Polysemes

Challenges Undergraduate Student Translators Face In Translating Polysemes From English to Arabic And Arabic To English (Al-Jarf, 2022b)

The study examined undergraduate student translators' difficulties in translating English and Arabic polysemes. Analysis of homework and exam data showed that students made more errors when translating Arabic > English than English > Arabic, especially with polysemous compounds. Frequent problems included overgeneralizing one familiar equivalent to all contexts—for example, translating "*system"* the same way in *political system*, *immune system*, and *computer system*, or using one meaning of "*develop"* in all contexts. Students also mistranslated polysemous nouns such as "plant" (factory vs. tree) and affairs (political vs. personal), and produced literal translations for fixed expressions, leading to errors such as *"chemical plants"* interpreted as "نباتات كيميائية". Additional difficulties arose from limited L1 vocabulary (multiple Arabic terms for "parliament"), unfamiliarity with specialized meanings (*chemical plants*, *exchange programs*), and insufficient world knowledge. Students often relied on literal translation, phonological approximation, or inappropriate paraphrases when unsure of the correct equivalent. The study recommends strengthening students' vocabulary depth, contextual analysis skills, domain awareness, and metacognitive strategies for interpreting polysemous meanings.

(F) Translating Collocations

Undergraduate Student-Translators' Difficulties in Translating English Word + Preposition Collocations to Arabic (Al-Jarf, 2022i)

Word+Particle Collocation Errors in English–Arabic Translation (Al-Jarf, 2009)

Faulty collocations collected from graduation projects and translation assignments revealed recurring structural mismatches between English and Arabic. Students frequently mistranslated prepositions and particles, with 84% of errors involving substitution (using في instead of عن in *stopped participating* >توقّف عن المشاركة), 13% involving addition of an unnecessary preposition (wait for > ينتظر without a preposition). They deleted a required particle (3%). Three structural patterns were identified across both studies: (i) Direct matches between English and Arabic (apologize for/to > يعتذر لـ/عن); (ii) English uses a preposition but Arabic does not (e.g., wait for > ينتظر); (iii) Arabic uses a preposition but English does not (lacks something > يفتقر إلى). 81% of the errors were intralingual (lack of L1 (Arabic) competence), while 19% were interlingual (transfer from English). Syntactic errors constituted (86%), semantic (11%) and stylistic (3%). Students relied on literal translation and dialectal usage, leading to inaccurate collocational choices. The study recommended explicit instruction in Arabic prepositional patterns, contrastive analysis of English–Arabic collocations, and training in context-sensitive translation strategies.

(G) Translating Pronouns

Interlingual Pronoun Errors In English–Arabic Translation (Al-Jarf, 2010)

A corpus of faulty uses of Arabic independent subject pronouns was collected from the translation projects of senior students at COLT. It was found that students translate imitatively rather than discriminately. Since English sentences begin with a subject pronoun such as I, he, they, the students used an independent subject pronoun followed by a verb+ pronominal suffix in a declarative, affirmative statement, without realizing that the subject is contained in the verb, and use of /?ana/ or /huwa/ is redundant. Implications for increasing students' awareness of pragmatic, discoursal and syntactic constraints in translating English pronouns into Arabic are provided.

(H) Translating technical terms

Translating English and Arabic Common Names of Chemical Compounds by Student-Translators in Saudi Arabia (Al-Jarf, 2022c)

A corpus of English and Arabic common names of chemical compounds was collected from online resources. A contrastive analysis of English and Arabic common names revealed several types of Arabic equivalents such as: (1) pure Arabic equivalents (Acetic Acid: Vinegar الخل); (2) borrowings (Ferric Oxide: hematite الهيماتيت); (3) Arabized (naturalized) equivalents (Potassium Carbonate: Potash البوتاس); (4) semi-borrowed (Sodium Hydroxide: caustic soda الصودا الكاوية); (5) multiple equivalents (Ammonium Chloride: ammonia الأمونيا، النشادر) (6) calques (English salt الملح الانجليزي); (7) neologism (Lactic Acid حمض اللبنيك); and (8) old names (*Red Antimony*زنفجر). Student-translators had difficulty translating English chemical common names to Arabic. They gave correct responses to fewer than 20% of the test items; and left 55% blank. Their most common translation strategy was transliteration of the English name and literal translation. The students reported that they were not familiar with most of the English and Arabic chemical common names.

Translation Students' Difficulties with English Neologisms (Al-Jarf, 2010d)

A sample of junior students majoring in translation at COLT enrolled in an Arabization course received direct instruction in word formation processes in English and Arabic such as compounding, derivation, back formation, conversion, blends, clipping, acronyms and neologisms. The focus was on similarities and differences between English and Arabic and how English lexical items in each category can be translated into Arabic. A neologisms post-test results showed that the students had difficulty recognizing, understanding the meaning of, and translating English neologisms into Arabic. The students tended to translate neologisms literally rather than conceptually and gave single-word equivalents rather than a borrowing, periphrasis or explanatory equivalent. Students' difficulties were due to unfamiliarity with English neologisms, lack of background knowledge, and inability to infer the meaning of neologisms from context.

Cluster 5 — AI as a tool for transliterating and translating terminology

Translation of Medical Terms By AI: A Comparative Linguistic Study of Microsoft Copilot and Google Translate (Al-Jarf, 2024d)

A purposive, random sample of 204 English and Arabic medical terms was translated by Microsoft Copilot (MC) and Google Translate (GT). Results showed that MC and GT gave accurate equivalents to 68.6% and 74.5% of the medical terms respectively. Both gave more correct equivalents to Arabic than English terms. Nevertheless, there were semantic, contextual, and syntactic inaccuracies. GT transliterated ابو دغيم "Abu Dhghaim", and translated العشى الليلي (Night Dinner) literally. Both gave compound equivalents with different word orders. For "fibroglandular tissues", MC yielded الليفية الغديّة الأنسجة and GT yielded الأنسجة الغدية الليفية. Both made errors in definiteness as الحماض الكيتوني by GT. MC gave an explanatory equivalent for "diabetic ketoacidosis" حمضية الدم المتأتية من السكري, whereas GT gave a concise equivalent (الحماض الكيتوني السكري). MC gave the equivalent 'lupus' for both الذئبة الحمراء & الثعلبة and the extraneous translation الغدي الليفية with awkward grammatical agreement and derivation, and GT gave a semantically inaccurate equivalent تعظم ليفي . Both made contextual errors as *approach/method* for نهجة.

Translation of English and Arabic "sleep" terms and formulaic expressions by Artificial Intelligence: A comparison of Copilot and DeepSeek (Al-Jarf, 2025i)

Microsoft Copilot (MC) and DeepSeek (DS) rendered 91% correct equivalents to English sleep idioms, 79% and 71.5% correct equivalents to English formulaic expressions respectively, and 48% and 49% of the Arabic terms and formulaic expressions respectively. The most common translation strategy was literal, word for word translation (نمت كالقتيلة *I slept like the dead* instead of *slept like a log)*. DS gave an explanation or annotation following the equivalent in 14% and MC in 3% of the Arabic items (طار النَّومُ من عينيه Sleep flew from his eyes (*couldn't sleep*). AI tends to translate Arabic sleep items literally based on surface meaning due to an AI default literal translation strategy and tendency to flatten nuance. Higher percentages of correct equivalents to English sleep items were given in this study than medical terms, zero-expressions, expressions of impossibility, Gaza-Israel War terminology, Arabic grammatical terms used metaphorically, Abu & Umm medical folk terms, Abu brand names and Abu & Umm metonymic animal and plant folk names. English-Arabic translation was easier than Arabic-English translation because most AI models are trained on English-dominant corpora, with English-Arabic translation receiving more attention and refinement than Arabic-English translation. Arabic-English translation is also less represented in the AI corpora, leading to lower performance.

DeepSeek, Google Translate and Copilot's Translation of Arabic grammatical terms used metaphorically (Al-Jarf, 2025f)

A sample of 52 Arabic Grammatical Terms **(**AGTs) used as metaphors and fixed expressions was collected and translated by DeepSeek (DS), Google Translate (GT) and Microsoft Copilot (MC). Results showed that the highest correct translations were rendered by MC (43%), followed by DS (29%), and the least by GT (23.5%). DS, GT and MC gave identical (correct and incorrect) translations to 57% of the terms. They tended to translate word for word, which sometimes resulted in weird and funny equivalents (بين بين between between). Examples of terms with identical translations by the three AI tools are كائنا من كان *whoever it may be*, داعش واخواتها *ISIS and its sisters*, الدول العربية مفعول به *the Arab countries are the object*. The three AI tools had difficulties with polysemous AGTs and those with a cultural content as those used in titles of TV shows, those requiring a historical background (فيها ان) and those used as slogans. The percentage of correct translations rendered by AI herein is the lowest compared to medical and Gaza-Israel war terminology, zero-expressions and educational polysemes. The study recommended raising students' awareness of the weaknesses that AI has in translating AGT metaphors.

AI translation of the Gaza-Israel war terminology (Al-Jarf, 2025b).

A sample of 250 English and Arabic 2023-2024 Gaza-Israel War terminology was collected from mainstream media. The terms were translated by Microsoft Copilot (MC) and Google Translate (GT). MC gave more accurate equivalents than GT (29% & 23% respectively). They gave identical correct equivalents (correct and incorrect) to 48% of the terms. Both gave correct equivalents

with a different wording to غزو بري (MC) & التوغل البري (GT) for ground incursion. MC gave an explanatory equivalent as قاذفة صواريخ متعددة الأغراض for RPG, whereas GT gave ار بي جي. Both made contextual errors (ملاط الياسين (GT) for Al-Yassin mortar). For carpet bombing, MC gave قصف السجاد & GT gave تفجير السجاد which have semantic and syntactic errors. GT gave extraneous translations for chief of staff رئيس العمال. Both gave equivalents with faulty word order as نظام ذو مدى أطول (MC) and نظام أبعد مدى (GT) for long-range system. GT gave definite equivalents to 20% (الفجر-5). Some equivalents have orthographic variations as (هاغانا (MC), الهاجاناه (GT).

Translation of Arabic Folk Medical Terms with Om and Abu By AI: A Comparison of Microsoft Copilot and Deepseek (Al-Jarf, 2025h)

Microsoft Copilot (MC) translated 46% of the Om- and Abu *folk medical terms* correctly compared to 66% by DeepSeek (DS) (أُمُّ الدَّمِ الأَوَّلِيَّة primary aneurysm). MC rendered more word-for word translations than DS (16% and 11% respectively). Here أم Om and أبو Abu were literally translated as "mother" and "father" not as a prefix. أبو الرّكَب was translated as "father of the knees" instead of "dengue", أم التلافيف "mother of folds" instead of omasum psalterium. MC and DS rendered lexical variants (synonyms) as *cerebral aneurysm* for أُمُّ الدَّمِ الدِّماغِيَّة instead of *brain aneurysm*. Both MC and DS rendered equivalents with a different word order (*cavernous carotid aneurysm* for أُمُّ الدَّمِ السُّباتِيَّةُ الكَهْفِيَّة instead of *caroticocavernous aneurysm*). AI translated folk medical terms with أم Om & أبو Abu with lower accuracy than modern medical terms but a higher accuracy rate than expressions of impossibility, Gaza-Israel war terminology, grammatical terms used metaphorically, and zero expressions which are current and commonly used by Arabic speakers. Students need to understand how to prompt and guide AI models by specifying the context, intent, and audience and should interpret AI outputs critically.

Can Artificial Intelligence (AI) Translate Arabic Abu-Brand Names with Different Prompts (Al-Jarf, 2025d)

A sample of 100 Abu-brand names was collected and translated by Microsoft Copilot (MC) and DeepSeek (DS) using three different prompts/tasks. In the three tasks, MC gave literal word-for-word translations of all 100 brand names, where it translated Abu as "father of" and the following noun semantically, whether the prompt specified the phrase type or not and whether each brand name was associated with the product name or not. Similarly, DS gave a literal word-for-word translation of all the brand names in tasks 1 and 2, but when the product name was added, DS treated the brand names as Proper Nouns and transliterated them all in English regardless of whether they were coined by the manufacturers, business owners or consumers. 66% of the transliterations by DS were correctly used, but 34% were not supposed to be transliterated as they were grassroots (folk-coined) brand names, based on the packaging image, not the original English brand name which some consumers find difficult to pronounce and remember. As a result, they coin a nickname based on the image on the packaging. Instead, the original English brand name should have been given by AI as an equivalent to grassroots brand-names (Tiger balm instead of *Abu Nimr Ointment* for ابو نمر مرهم). Both MC and DS gave identical English equivalents to 83% of the items in tasks 1 and 2. Additionally, DS gave double equivalents to 14.5% of the items in set 1, and faulty annotations/explanations of the brand name that show extraneous inferences and faulty guesses based on kunyas and nicknames that do not match a commercial context.

Copilot Vs Deepseek's Translation of Denotative and Metonymic Abu- And Umm- Animal and Plant Folk Names in Arabic (Al-Jarf, 2025e)

Data analysis showed that Deepseek (DS) gave higher correct equivalents to the no-domain prompt (51% by DS vs 46% by Copilot (MC) and the domain prompt (51% by DS vs 44% by MC). The equivalent animal's name was directly given without any translation, transliteration or annotation. Both gave identical responses to 40% of the denotative items. In the metonymic name list, both MC and DS failed to identify the exact animal or plant type to which each Abu-metonyms refers in response to all 3 prompts. Both gave fewer than 3% correct responses to all 3 prompts. Similar equivalents were given to each Umm-name in response to the three prompts, of which MC gave 30% correct. DS failed to give correct responses to all items in the no-domain prompt, 97%-99% faulty responses to the domain prompt and metonymic prompt, respectively. MC translated Abu to "father" (46%); translated Abu + Noun semantically without "father" (32%); made faulty guesses (17%), transliterated the noun following Abu in 57% and translated it (43%). Both MC and DS considered metonymic names as personal names (55% by MC and 95% by DS). DS translated أبو Abu to "father" in 27%. In the annotation, DS gave the genus, not the specific animal implied and it rendered "lizard" as the referent animal in all items in response to the metonymic prompt.

AI Translation of Full-Text Arabic Research Articles: The Case of Educational Polysemes (Al-Jarf, 2025a)

Data analysis showed that in research articles, AI has difficulty translating polysemes that have general and specialized meanings and two or more English equivalents, such as صدق which has the general equivalent "honesty" and the technical equivalent "validity" used in research; التحكيم والمحكمون are used in legal, sports and research contexts, but AI gave the equivalent used in legal contexts, not the one used in an educational contexts. It gave "arbitration" & "arbitrators" rather than "peer reviewing" & "reviewers". رسالة has 4 meanings in Arabic with 4 English equivalents (thesis, message, mission & letter) depending on the context. Most occurrences of رسالة were translated into "message", rather than "thesis". AI tended to give literal, not conceptual,

equivalents to Arabic terms and those used in a particular domain. The study recommends that researchers use AI translation with caution, post-edit the translation, and use the technical terms commonly used in education.

Arabic Transliteration of Borrowed English Nouns with /G/ by Artificial Intelligence (Al-Jarf, 2025c)

140 English nouns containing the letter g pronounced /g/ were collected and transliterated by Microsoft Copilot (MC) and Google Translate (GT). In 61% of the English nouns, MC and GT used غ /ɣ/ to represent /g/, of which غ is pronounced /ɣ/ (17%) as Singapore سنغافورة, and غ is pronounced /g/ in 44% (Angola أنغولا). In 37%, the Arabic equivalents are transcribed with ج, where ج is pronounced /g/ in 27% (Copenhagen كوبنهاجن) and ج is pronounced /dʒ/ in 10% (Galaxy جالكسي). Use of غ is more common in the Levant whereas ج is more common in Egyptian Arabic. MC and GT gave a single Arabic transliteration to each English noun, whereas human transliterators yielded two or more transliterations to 16% of the sample (Google قوقل جوجل جوجل كوكل غوغل گوگل چوچل). Speakers of Saudi Arabic use ق (Goody قودي, Golf قولف). Transliteration variations in Arabic are caused by regional and dialectal variations, lack of knowledge, old, established transliterations of names, especially in the geopolitical domain (Chicago شيكاغو), lack of standardization in Arab countries, and contextual and pragmatic factors.

An Investigation of Google's English-Arabic Translation of Technical Terms (Al-Jarf, 2021a)

A random sample of English technical terms was translated by Google Translate (GT). It was found that GT gives Arabic equivalents to the full range of meanings of some terms such as 'mobilization' and 'technical', but it is inconsistent in translating terms with varying prefixes, roots combined with the same suffix, compounds and blends. A team of linguists or specialists is needed to revise, add and supervise scientific terms included in the Google English-Arabic translation dictionary. Students wishing to use the Google English-Arabic translation tools need to be cautious and are advised to verify meanings obtained from GT with their teacher or a specialist.

Human Vs AI Translation of Common Names of Chemical Compounds (Al-Jarf, 2025i)

In Al-Jarf's (2022c) study, undergraduate student-translators gave correct responses to fewer than 20% of the CNCC on the test and left 55% blank. Their most common translation strategies were literal translation and transliteration. The same English and Arabic CNCC sample on the test was translated by MC. MC translated 72% correctly and gave more Arabic-English (40%) than English-Arabic (32%) correct equivalents, especially when the domain was specified and when MC was asked for all the equivalents it knows. MC gave literal word-for-word translation to terms (Lunar caustic > (نترات الفضة) الكاوي القمري; transliteration (Stearic acid > حمض الستيريك instead of حمض الشمع); gave a faulty derivative (Chlorinating powder > مسحوق التكلور instead of مسحوق الكلورة) and an explanation (Ammonia liquor سائل الأمونيا). Since translation-students' knowledge of CNCC is limited, they are advised to specify the kind of terms to be translated by AI, give the context, nuance, translation direction and ask AI to give as many equivalents as possible.

4.1 Meta-Conclusion

Across the five thematic clusters, results demonstrate that EFL vocabulary learning, assessment, and translation are shaped by a consistent pattern: students benefit most when instruction explicitly builds lexical connections, phonological, morphological, semantic, and contextual, while technology enhances learning only when it is meaningfully integrated into pedagogical design. Studies on teaching approaches, mind-mapping, mobile apps, and online tasks converge on the conclusion that structured, multimodal, and association-rich instruction leads to significant gains in vocabulary knowledge. Assessment studies similarly show that reliable evaluation requires multi-level tasks that cover pronunciation, spelling, morphology, semantics, and usage. Research on learning difficulties and translation errors confirms that weaknesses in phoneme–grapheme relationships, morphology, pronunciation, collocations, plurals, and polysemes persist across learners, and that literal translation strategies dominate both human and AI performance. Collectively, the corpus establishes that vocabulary learning is a multi-component process requiring explicit instruction, scaffolded practice, and tools that support depth rather than surface memorization.

4.2 Meta-Interpretation

Findings across clusters reveal that the core challenge for EFL learners is not vocabulary size per se, but the depth of lexical processing required to use words accurately in reading, writing, pronunciation, and translation. The recurring errors, whether in suffixation, plural formation, collocations, or polysemes, indicate that learners rely heavily on surface cues such as spelling, L1 analogy, and literal meaning, rather than conceptual, morphological, or contextual understanding. Technology-based tools as mind-mapping, mobile apps, online tasks, iRubrics, are effective because they externalize relationships between lexical features and provide structured scaffolding that compensates for learners' weak internal lexical networks. Translation studies further show that both students and AI systems struggle with semantic nuance, idiomaticity, and domain-specific meanings, reinforcing the interpretation that vocabulary mastery requires deep semantic awareness and cross-linguistic contrastive competence. Thus, the corpus suggests that vocabulary development is a cognitive-linguistic process that improves when instruction targets underlying structures rather than isolated word forms.

A. *4.3 Cross-Cutting Insights*

Several insights cut across all clusters. First, association-building emerges as the most powerful mechanism for vocabulary learning, whether through multiple-association instruction, mind-maps, or multi-component testing. Second, technology amplifies learning only when it mirrors sound pedagogy, not when used as an add-on; the most successful tools are those that visualize relationships, provide immediate feedback, or support self-regulated practice. Third, errors across domains share common roots: reliance on literal translation, orthographic influence, L1 transfer, and limited exposure to authentic input. These patterns appear in pronunciation and morphological errors, collocational misuse, plural translation, and AI mistranslations alike. Fourth, Arabic–English asymmetry is a persistent theme: learners and AI systems perform better from English>Arabic than Arabic>English, especially with polysemes, idioms, and culturally embedded expressions. Finally, the corpus highlights a systemic need for explicit instruction in contrastive analysis, domain-specific vocabulary, and metacognitive strategies, suggesting that vocabulary pedagogy, assessment, and translation training must be aligned to address shared underlying weaknesses.

4.4 Implications

The findings across the five clusters carry several implications for EFL pedagogy, assessment, and translator training. First, vocabulary instruction must shift from isolated word teaching to approaches that show lexical associations (phonological, morphological, semantic, and contextual) since weaknesses in these areas consistently underlie learners' errors in pronunciation, spelling, morphology, collocations, and translation. Second, technology should be integrated strategically rather than superficially: mind-mapping tools, mobile apps, online tasks, YouTube-based pronunciation practice, and iRubrics are most effective when they visualize lexical relationships, support self-regulated learning and scaffold cognitive processes. Third, assessment practices need to adopt multi-component testing models that capture the full range of vocabulary knowledge, ensuring reliability, validity, and diagnostic value for remedial instruction. Finally, translation training must explicitly address cross-linguistic contrasts, domain-specific terminology, and the pitfalls of literal translation, as students and struggle with polysemes, plurals, collocations, and culturally embedded expressions. AI systems struggled with terminology, polysemes and culturally embedded expressions.

4.5 Positioning This SR Within SRs on role of Global Vocabulary Teaching and Learning SRs

Within the broader scope of global SRs on vocabulary teaching and learning, this SR occupies a distinct position by integrating instructional approaches, technology-enhanced learning, assessment practices, and translation-related lexical challenges into a single, coherent framework. While global SRs typically focus on isolated strands, such as digital tools, vocabulary strategies, or learner difficulties, this review synthesizes 43 studies spanning mind-mapping, mobile apps, online tasks, dictionary use, pronunciation training, morphological and phonological difficulties, and translation of plurals, polysemes, and collocations. Unlike global SRs that often emphasize vocabulary size or strategy frequency, this SR foregrounds lexical depth, multi-component processing, and cross-linguistic influences, offering a more comprehensive account of how vocabulary is taught, learned, assessed, and operationalized in real EFL contexts. By doing so, it bridges gaps in the international literature and provides a unified model that connects pedagogy, assessment, learner cognition, and translation competence.

4.6 *How This SR Connects to the Author's Previous SRs*

This SR forms part of a broader, long-term program of SRs and meta-analyses conducted by the author, covering two-three decades of research across EFL pedagogy, linguistics, translation, assessment, technology integration, and Arabic language education. The author's previous SRs span diverse domains, including art-education English instruction, EFL reading pedagogy, educational evaluation, translation errors, mobile-assisted language learning, adult reading practices, pronunciation instruction, Arabic reading curricula, electronic searching, skill-specific assessment, transliteration, children's language acquisition, creativity and writing development, collaborative digital learning, distance learning during COVID-19, mind-mapping effectiveness, staffing challenges in EFL programs, Arabic word-formation processes, online videos and podcasts, AI Arabic translation, ESP innovation, LMS-supported instruction, and social-media-mediated EFL learning. Within this extensive body of work, the current SR occupies a unique position by focusing specifically on vocabulary teaching, learning, assessment, and translation, synthesizing evidence across instructional approaches, technological tools, learner difficulties, and cross-linguistic processing. It extends the author's earlier SRs by offering a more granular, lexically focused synthesis that connects pedagogical design, cognitive processing, assessment models, and translation competence, thereby deepening and systematizing themes that have appeared across the author's previous reviews.

4.7 *Limitations of This SR*

This author-bounded SR is limited to studies conducted and published by the author between 2005 and 2026, and therefore does not include external research on global vocabulary instruction, assessment, or translation. The scope reflects the instructional contexts, learner populations, technological tools, and assessment practices represented in these studies, which may differ from those used in other institutions or countries. Because the corpus spans two decades, some earlier technologies, platforms, and pedagogical practices may now be outdated or replaced by more recent innovations. The studies also vary in

design, sample size, and methodological rigor, which affects the comparability of findings across clusters. In addition, this SR synthesizes research that focuses primarily on college-level EFL learners in the Saudi context, limiting generalizability to younger learners, other proficiency levels, or multilingual environments. Finally, the SR does not attempt to quantify effect sizes or conduct meta-analytic statistical modeling; instead, it provides a qualitative synthesis of patterns, themes, and pedagogical implications within the author's body of work.

5. Recommendations

The findings across the five clusters highlight the need for vocabulary instruction that systematically integrates lexical associations, multimodal input, and explicit contrastive analysis. Teachers should adopt instructional designs that connect pronunciation, morphology, semantics, and usage rather than treating vocabulary as isolated items. Technology should be used purposefully, mind-mapping tools, mobile apps, online tasks, YouTube-based pronunciation practice, and iRubrics are most effective when they scaffold cognitive processing and support self-regulated learning. Assessment practices should incorporate multi-component tasks that diagnose weaknesses and guide remedial instruction. Translation training must explicitly address polysemy, collocations, plurals, and culturally embedded expressions, with emphasis on contextual interpretation rather than literal transfer.

AI can be integrated into vocabulary and terminology instruction by providing personalized practice, generating contextualized examples, and offering instant explanations and feedback. AI tools can create adaptive quizzes, visual representations of technical terms, and discipline-specific scenarios that strengthen lexical associations and deepen understanding. They also support learners by transcribing lectures, extracting key terminology, and enabling students to compare human and machine translations to develop critical awareness of technical equivalents. When used strategically, AI enhances exposure, reinforces retention, and helps instructors diagnose weaknesses and plan targeted remedial work.

5.1 Directions for Future Research

Future research should expand beyond college-level EFL learners to include younger learners, multilingual contexts, and diverse educational settings to examine how lexical development unfolds across proficiency levels. More empirical studies are needed on the long-term impact of multimodal tools, mind-mapping, mobile apps, and online platforms on vocabulary depth, retention, and transfer to reading, writing, pronunciation, and translation. Research should also investigate how learners develop sensitivity to polysemes, collocations, morphological patterns, and phoneme–grapheme correspondences, and how instructional interventions can strengthen these skills. Given the growing role of AI in translation and language learning, future studies should examine how AI tools handle domain-specific vocabulary, idiomaticity, and cross-linguistic contrasts, and how learners can be trained to critically evaluate AI-generated output. Finally, meta-analytic work is needed to quantify effect sizes across instructional approaches and technological tools to provide stronger evidence for pedagogical decision-making.

6. Conclusion

This SR synthesizes two decades of research on vocabulary teaching, learning, assessment, and translation, revealing that vocabulary development is a multi-component process shaped by phonological, morphological, semantic, and contextual factors. Effective instruction consistently emphasizes lexical associations, structured scaffolding, and multimodal input, while technology enhances learning when aligned with sound pedagogy. Assessment studies show that reliable evaluation requires multi-level tasks that capture the full spectrum of vocabulary knowledge. Research on learner difficulties and translation errors demonstrates persistent challenges with phoneme–grapheme mapping, morphology, pronunciation, collocations, plurals, and polysemes, as well as a strong tendency toward literal translation. Together, the findings underscore the need for pedagogical designs that target lexical depth rather than surface memorization, and for integrated approaches that connect teaching, assessment, and translation training. This SR contributes a comprehensive, lexically focused synthesis that advances understanding of how vocabulary is acquired and operationalized in EFL contexts and provides a foundation for future research and instructional innovation.

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