

Bibliometric Mapping of Trends in EFL Vocabulary Studies: Performance and Intellectual Structure

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Abstract: Bibliometric analysis of vocabulary in EFL is limited. This limitation is due to the topic's specificity. Updated bibliographic data on vocabulary in EFL is essential to support future research on the topic, specifically in the context of EFL. This study addressed this gap by conducting a bibliometric analysis of 117 research or review articles sourced from the Scopus database. The data were retrieved using the PRISMA data collection scheme, which was later processed and visualized using Biblioshiny-R and VOSViewer. The analysis focused on trends in annual production (2014-2024), key authors, frequently used keywords, and highly cited documents. The results showed that the annual scientific production from 2014-2024 experienced notable fluctuations, with 2014 being the most productive year (31 documents) and 2017 the least (2 documents). The authorship analysis revealed a relatively small group of recurring contributors, such as Qun Wu, Hifen Lin, and Mark Feng Teng, indicating that although productivity per author was modest, these researchers collectively shaped the direction of EFL vocabulary scholarship. Keyword co-occurrence analysis highlighted "vocabulary," "vocabulary learning," and "EFL" as the most dominant terms, showing that research in this field focuses strongly on lexical development within foreign-language contexts. Citation analysis showed that Blasco (2015), Klimova (2021), and Sidek (2015) produced the most influential records centered on cognitive linguistics, mobile learning, and vocabulary relationships. This study updates and systematizes the fragmented landscape of EFL vocabulary research, revealing a clear shift toward technology-mediated, corpus-informed, and cognitively oriented approaches. The findings offer a renewed foundation for future researchers to further develop and expand this field.

Keywords: bibliometric analysis, EFL, vocabulary.

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■ INTRODUCTION

Vocabulary intensification is a prominent part of constructing language ability, as vocabulary knowledge certainly affects comprehension of sentences amongst language learners (Allal-Sumoto et al., 2023). In EFL learning and teaching activities, vocabulary is considered the basis for learning English across all skills (Nation, 2011). It can be noted that vocabulary is often viewed as a vital resource for those learning English as a foreign or second language, as limited vocabulary knowledge can interfere with

successful communication (Alqahtani, 2015). As vocabulary is considered supreme, it is a must for EFL learners to have adequate knowledge of English vocabulary. Nowadays, numerous studies aim to bridge EFL vocabulary enhancement with more advanced modern approaches to science, such as artificial intelligence, gamification in education, and digital literacy (Chawla et al., 2024; Haoming & Wei, 2024). A more mainstream, ordinary approach to EFL vocabulary study, such as acquiring vocabulary through contextualized content, is also still being

used in this era (Teng et al., 2024). The importance of vocabulary and the vast scope of EFL vocabulary studies underscore the urgency and trends in this field.

The massive research output on vocabulary has increased interest in bibliometric studies worldwide. Bibliometric analysis is a widely used and powerful approach for examining and interpreting extensive scientific data, as it helps uncover developmental patterns within a field of study while highlighting emerging trends and areas of focus (Donthu et al., 2021). Bibliometric analysis offers a valuable approach that quantitatively examines connections among journals to map the existing knowledge base and evolving research directions of a field by reviewing extensive scholarly literature, while also revealing collaborative patterns, author-citation networks, and the broad structure of the research area (He et al., 2020). Bibliometric analysis of vocabulary trends has been conducted by several researchers (see, for example, Meara, 1983; Fei et al., 2024; Khairati, 2024; Chang & Chang, 2023; Mohd Zainol et al., 2025; Feng, 2025).

A research related to bibliometric analysis on vocabulary was conducted by Meara (1983) with the title "Vocabulary in a Second Language. Specialised Bibliography 3 [Covering 1960-1980]". This bibliography focuses on vocabulary acquisition and word processing in second languages, specifically English, published between 1960 and 1980. The research is divided into two sections. The first section is a list of 280 data entries, complemented by a brief abstract for each, and the second section is the supplementary bibliography containing publication years and less central words, without the abstracts. Additionally, the document includes a glossary of terms, a subject index, and a language index for reference. While this research can document vocabulary trends in a second language from 1960 to 1980, a renewal of trend documentation in this field is

needed to keep up with the latest research, developments in science, and changes in the language field. Rejuvenation of bibliometric analysis, in this case, the vocabulary field, is needed to ensure the field of study's relevance (Mammola et al., 2020).

A 2024 study by Fei et al. attempted to address that challenge. The study titled "Bibliometric Evaluation of Publications on Second Language Vocabulary Acquisition (2000-2024)" offers a bibliometric analysis of the topic of vocabulary in second language acquisition. This study alluded to a topic and approach similar to those of Meara's 1983 study. However, this more recent study by Fei et al. includes newer studies from 2000 to 2024 and uses a different bibliometric analysis technique. Meara's 1983 study provides individual lists of abstracts, publication years, and keywords, which must be compiled manually without any supporting figures, such as graphics, charts, or tables. Meanwhile, Fei et al.'s 2024 study provides information on publication years, countries, institutions, authors, and keywords for studies retracted from the Web of Science database, presented in tables and charts.

In addition to the bibliometric analysis of vocabulary studies related to second language, there are also analyses of vocabulary studies related to other topics, such as games. Research on vocabulary learning through gamified or game-based environments has been explored through a bibliometric approach in both Khairati (2024) and Chang and Chang (2023), with their scope and methodological designs differing substantially. Khairati's study focuses on publications from 2017 to 2023 explicitly related to online games used to improve English vocabulary, gathering 463 publications from Google Scholar using Publish or Perish and analyzing them using VOSviewer. In contrast, Chang and Chang examined a broader theme, which is game-based learning and

gamification applied to vocabulary learning, covering two decades (2000-2020) and retrieving 125 documents from the Scopus database. While both studies employ VOSviewer to map keywords, authorship, and conceptual structures, Chang and Chang further incorporate CiteSpace, CReXplorer, and Bibliometrix to generate a multilayered analysis, thereby expanding their methodological toolkit. Khairati's study is more descriptive and centers on trends such as dominant countries, frequent keywords, and annual publication patterns. In contrast, Chang and Chang place stronger emphasis on geographical distribution, social networks, and thematic evolution within the global research landscape. Another notable difference is that Chang and Chang follow a PRISMA-style workflow for screening, ensuring strict criteria for document inclusion, while Khairati uses keyword-based harvesting without an equivalent multi-stage filtering structure. Together, the two studies demonstrate how bibliometric analysis can vary in depth, database reliability, and analytical breadth when applied to the overlapping domains of vocabulary learning and gaming.

Bibliometric analyses on vocabulary learning supported by technology were also conducted by Mohd Zainol et al. (2025) and Feng (2025). Although both studies focus on technology-enhanced vocabulary instruction, their bibliometric designs differ clearly. Mohd Zainol et al. analyze 1,331 publications from 2019-2024, drawing exclusively from Scopus and employing Scopus Analyzer and VOSviewer to map co-authorship, keyword trends, and thematic clusters in research linking vocabulary and technology. Feng, however, performs a far larger bibliometric review using 3,307 documents (2014-2024) sourced from the Web of Science Core Collection and examines intellectual structures, thematic evolution, and emerging research fronts in Technology-Enhanced Vocabulary Learning

(TEVL) using CiteSpace, VOSviewer, and Biblioshiny. The shorter timespan and the more recent emphasis in Mohd Zainol et al.'s study align with their goal of capturing developments since 2019, such as AI, mobile applications, and gamification. At the same time, Feng's decade-long window allows for observing long-term conceptual shifts from early computer-assisted learning to advanced AI and AR integrations. Methodologically, Feng's study emphasizes co-citation networks, burst keywords, and science mapping, offering a more theoretically oriented interpretation of the fields' evolution. In contrast, Mohd Zainol et al. (2025) focus more on descriptive trends, including leading countries, authors, and publication growth. Another distinction is that Feng limits documents to peer-reviewed articles, reviews, and early-access works, whereas Mohd Zainol et al. include conference proceedings, reflecting a broader inclusion strategy. Despite these differences, both studies indicate rapid growth in research on technology-related vocabulary and highlight emerging themes, such as AI-driven vocabulary tools and mobile-assisted learning.

Although recent bibliometric studies have examined vocabulary learning through online games, gamification, and technology, most of these reviews adopt broad scopes that extend beyond the specific needs of English as a Foreign Language (EFL) learners. Studies by Meara (1983) and Fei et al. (2024), while focusing on English vocabulary, situate their analyses within a broader second-language context rather than narrowing specifically to EFL learners, resulting in datasets and interpretations that blend various language-learning environments rather than isolating EFL-specific patterns. Studies such as Khairati (2024) and Chang and Chang (2023) investigate vocabulary learning through gaming. However, they do not isolate EFL learners as a distinct population; rather, they integrate

vocabulary into general second-language and technology-supported learning environments. Similarly, the technology-focused reviews by Mohd Zainol et al. (2025) and Feng (2025) map large bodies of research on vocabulary and digital tools without narrowing their analyses to EFL settings, often combining multilingual, bilingual, or general language-learning studies in their datasets. As a result, the existing bibliometric literature lacks a targeted synthesis that examines how vocabulary research specifically develops within EFL education, both in terms of thematic trends and methodological trajectories. The absence of targeted synthesis limits our understanding of EFL-specific pedagogical needs, learning challenges, and contextual patterns within vocabulary scholarship. Consequently, there remains a clear research gap for a dedicated bibliometric analysis focused solely on vocabulary research in the EFL domain, offering a more precise mapping of its development, contributions, and evolving themes.

To address this gap, this study aims to provide accurate bibliographic data on EFL vocabulary studies from 2014-2024, sourced from the Scopus database, and to filter the data using the PRISMA flowchart. Considering that EFL vocabulary is an important topic in English language education, this current bibliometric analysis might help future educators and researchers gather the data needed to support the statements in their studies. Hopefully, the results of this research can help future researchers identify annual trends, influential authors, relevant keywords, and influential documents in vocabulary studies related to EFL and provide opportunities for further investigation. Therefore, to offer thorough data and sources related to the EFL vocabulary topic, this bibliometric analysis attempts to answer following research questions:

- RQ1. How has the trend in EFL vocabulary study changed throughout the past decade?
- RQ2. Who are the most relevant authors who

contributed to the EFL vocabulary studies throughout the past decade?

- RQ3. What are the keyword trends on EFL vocabulary topics for the past decade?

- RQ4. What are the most globally cited documents in EFL vocabulary topics throughout the past decade?

■ **METHOD**

Research Design

In this study, a bibliometric analysis was conducted. Bibliometric analysis primarily focuses on analyzing broad, objective datasets, such as citation counts, publication volumes, and keyword occurrences, and this method is useful for organizing and analyzing large, unstructured data to better understand and map scientific knowledge and progress in established fields (Donthu et al., 2021). To answer the research questions, a bibliometric analysis was conducted to systematically investigate decade-long trends, influential authors, keyword trends, and influential documents in bibliometric studies on EFL vocabulary. A bibliometric analysis of this topic was selected to provide a coherent, traceable approach for gathering and unifying knowledge from hundreds of studies on vocabulary in EFL.

Data collection and the scheme were guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework. The PRISMA data collection method was chosen because it serves as an important guideline for filtering the data reviewed during the research process (Mishra & Mishra, 2023). This data-filtering guideline helps improve research quality (Sohrabi et al., 2021). The procedures in this study follow a series of ordered steps, including establishing inclusion criteria, identifying sources of information, selecting relevant literature, gathering data, and determining the specific data items to be used. The result of the bibliometric analysis is processed using a quantitative approach. Quantitative data are

numerical values obtained through experiments or mathematical models (Pilcher, 2023). The quantitative approach used to analyze the numerical data that are obtained through Biblioshiny-R and VOSViewer. The data is presented accurately using charts, word clouds, and tables.

Search Strategy

This bibliometric analysis of EFL vocabulary gathers all the data through the Scopus database to help the authors answer the research questions. Scopus was chosen as the data source for this bibliometric analysis because it provides extensive metadata, including titles, contributing authors, publication years, and other publication-related information (Christian et al., 2024). Can and Hou (2021) emphasize that Scopus contains a substantial repository of rigorous, peer-reviewed literature, ensuring comprehensive worldwide coverage of academic research. In addition, Scopus is widely recognized as a reliable source for bibliometric mapping due to

its compatibility with bibliometric tools such as Biblioshiny-R and VOSviewer. However, the authors acknowledge that reliance on a single database might limit the coverage of relevant studies indexed in other databases.

Journal articles, references, and other sources are accessible through the Scopus database, which enables both forward and backward time searching (Burnham, 2006). This feature enabled the authors to find studies on vocabulary in the EFL context and restricted them to the years 2014 to 2024. The Scopus database was accessed via the Elsevier ScienceDirect website. Science Direct was chosen as the gateway to the Scopus database because it was considered, by the authors, as a Scopus-indexed website to access huge collections of scientific articles, book chapters, and other research materials, which also provided full-text for its publications (What Is the Difference Between ScienceDirect and Scopus Data? Data as a Service Support Center, n.d.). For clarity, the search strategy is shown in Table 1

Table 1. Database and research strategy

Database	Scopus
Search period	2014-2024
Keyword	EFL vocabulary
Data retrieval date	November 10 th , 2024

With the keyword “EFL vocabulary”, 3,421 were successfully obtained without any filtering on year or publication type, and with double-checking of the context. It is important to note that the search was conducted using a single query and did not incorporate Boolean operators (e.g., AND, OR, NOT). While this approach successfully produced a large dataset, the absence of Boolean search strings may have reduced the precision and structure of the retrieval process. The authors acknowledge this as a methodological limitation, and we recognize that

a more sophisticated search strategy could further strengthen future studies. Details on the record numbers throughout the stages, as well as the briefly explained exclusion criteria, are depicted in the PRISMA flowchart in Figure 1.

The data collection method and scheme were guided using the PRISMA framework to ensure an organized process (Sohrabi et al., 2021). From the 3,421 records obtained from the Scopus database using the keyword “EFL vocabulary”, 1,218 records were excluded because they were not published between 2014

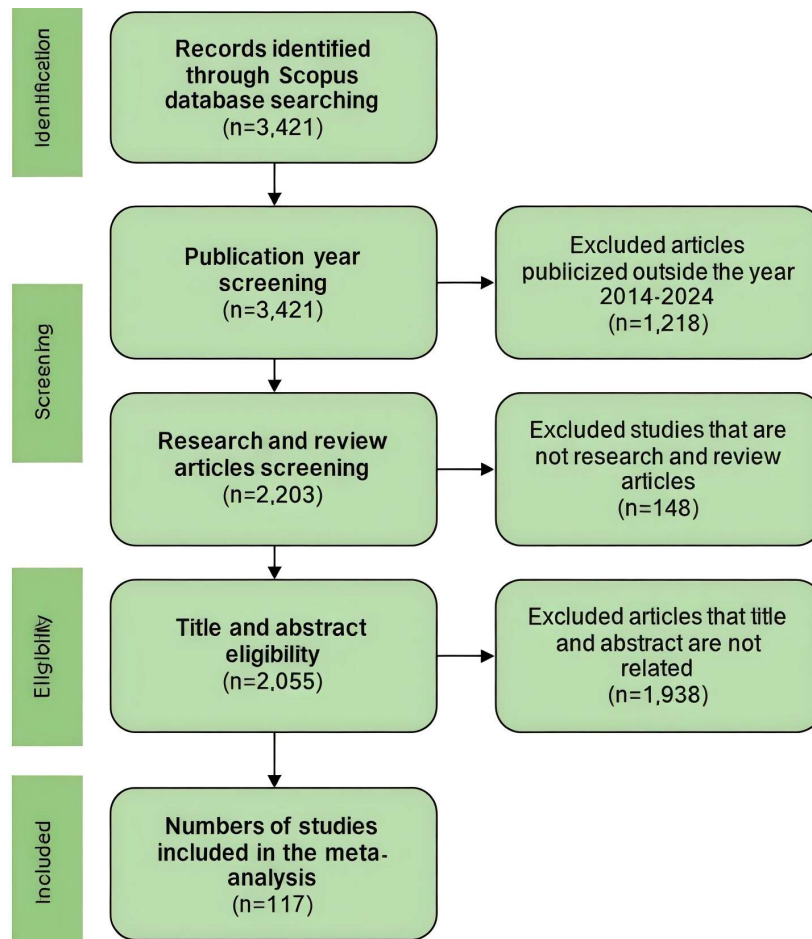


Figure 1. PRISMA flowchart

and 2024. In the type-of-record screening process, 148 records were excluded as not being review or research articles, leaving a total of 2,055 records. After that, the records screening process was continued manually through a two-step assessment of titles and abstracts. First, the title of each record was examined: articles in which both *EFL* (or *English as a foreign language*) and *vocabulary* explicitly appeared in the title were directly considered eligible. When only one of the two terms appeared in the title, the abstract was further reviewed to determine whether the study addressed vocabulary in an EFL context or examined EFL learning with a clear focus on vocabulary. Articles were included when both concepts were substantively connected at the conceptual level, even if both terms did not co-

occur in the title. Furthermore, no fixed lexical or word-distance threshold was applied; eligibility was based on conceptual relevance rather than physical proximity of keywords. As a result, 1,938 articles were excluded from the eligible records, and 117 articles were selected to proceed to the data analysis phase.

Data Analysis

The data analysis of the included articles was conducted using Biblioshiny-R (Aria & Cuccurullo, 2017) to generate bibliometric statistics and VOSviewer (Van Eck & Waltman, 2023) to generate keyword mapping. A supplementary tool for data visualization was executed using Microsoft Excel version 19127.20302. Any discrepancies in outputs from

the various software tools were addressed by the authors through re-verification of the data. We selected and examined the relevant information extracted from the results to summarize and reflect on the main findings. This careful review of the collected data ultimately guided the development and articulation of our research conclusions. By thoroughly analyzing the key points emerging from the results, we identified the most significant patterns and insights, which served as the foundation for informed, coherent conclusions.

Inclusion and Exclusion Criteria

To maintain transparency and allow the study to be replicated, inclusion and exclusion

criteria were clearly defined prior to the screening process. According to Petticrew and Roberts (2008), applying explicit criteria is essential in systematic reviews because it minimizes bias and outlines the boundaries of the evidence being evaluated. Establishing such criteria ensures that the review process remains structured and consistent. For this study, the guidelines were formulated to reflect the objectives and scope of the analysis. Specifically, they were developed to capture research on vocabulary in the EFL context. More detailed information regarding the inclusion and exclusion criteria is presented in Table 2.

Table 2. Inclusion and exclusion criteria

Category	Inclusion	Exclusion
Record type	Review and research articles	Encyclopedia, book chapters, conference abstracts, book reviews, case reports, correspondence, discussion, editorials, and news
Period of coverage	2004-2024	< 2014 (published before 2014) and > 2024 (published after 2024)
Topical appropriateness	Vocabulary in the context of EFL	Apart from vocabulary in the context of EFL
Language	Publications available in English	Publications not available in English

The inclusion and exclusion criteria were designed to ensure that the dataset reflected high-quality, relevant, and methodologically comparable research within the scope of EFL vocabulary studies. Review and research articles were prioritized because they provide empirical evidence or synthesized findings grounded in systematic inquiry, which aligns with the recommendations of Cooper (2015) and methodological standards outlined in the PRISMA guideline (Moher et al., 2009). Non-empirical sources such as encyclopedia entries, book chapters, conference abstracts, book reviews, correspondence, editorials, and news items were excluded because they do not reliably report research procedures and may introduce

inconsistencies in methodological quality. The period coverage (2004-2024) was clearly defined to maintain a manageable, relevant timeframe, a practice emphasized by Page et al. (2021) as essential to a transparent and coherent search strategy. Topical relevance was ensured by including only studies focused on vocabulary in the EFL context, thereby preventing conceptual drift and maintaining alignment between the research question and the evidence base. Finally, limiting the selection to English-language publications ensured consistency in interpretation and screening, a commonly accepted methodological decision within systematic reviews when justified (Moher et al., 2009; Page et al., 2021).

■ RESULT AND DISCUSSION

RQ1. How has the trend in EFL vocabulary study changed throughout the past decade?

The annual scientific production indicates substantial fluctuations in EFL vocabulary publications between 2014 and 2024. As shown in Figure 2, output peaked in 2014 with 31 publications, after which a sharp decline occurred: a 39% decrease in 2015 (19 articles), followed by another 37% drop in 2016 (12 articles), and an even more pronounced 83% fall in 2017 (2 articles). The steep decline after 2014 suggests a temporary shift away from scholarly focus on EFL vocabulary, potentially reflecting heightened attention to emerging areas of applied linguistics or the rise of alternative instructional paradigms

during that period. This fluctuating pattern of annual scientific production aligns with broader bibliometric trends, where publication output often shifts in response to changes in research priorities, funding availability, and disciplinary developments (Donthu et al., 2021). Publication numbers began to recover gradually, increasing by 50% in 2018 (3 articles) and 67% in 2019 (5 articles), before rising sharply by 120% in 2020 (11 articles). The sharp increase in 2020 is consistent with findings that global events, particularly the onset of the COVID-19 pandemic, can significantly reshape academic productivity and redirect researchers toward specific pedagogical concerns, including online learning environment (Ionnidis et al., 2020).

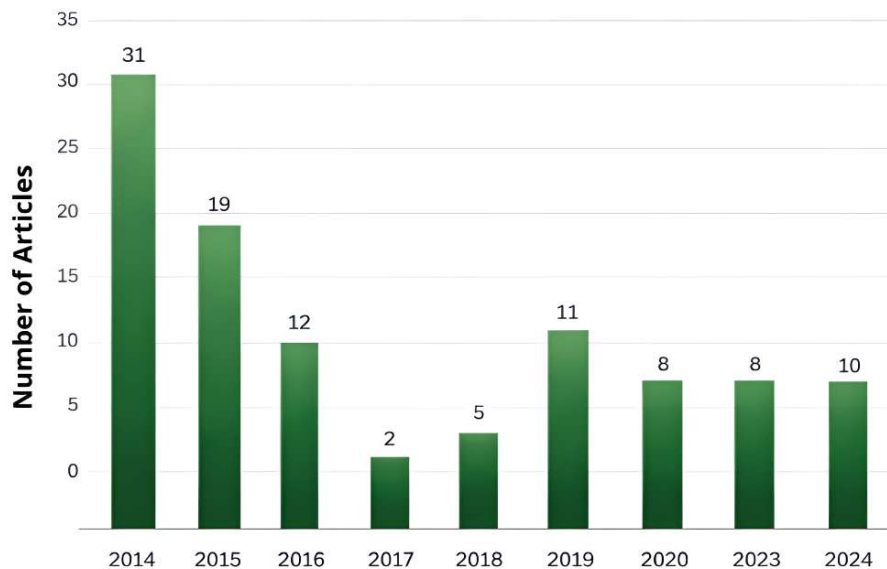


Figure 2. Chart of annual scientific production

The output then stabilized, with eight publications recorded consistently across 2021, 2022, and 2023. In 2024, the number rose moderately to 10 articles, reflecting a 25% increase from the preceding year. This corresponds to Aria and Cuccurullo's (2017) observation that research fields often enter phases of equilibrium as they mature, maintaining steady output before experiencing renewed growth.

Such stabilization may indicate that EFL vocabulary research has reached a consolidation stage, where established themes continue to be explored while new directions gradually emerge. The modest rise in 2024 suggests a reawakening of scholarly attention, potentially driven by technological advances, pedagogical innovations, or renewed interest in vocabulary as a core component of language proficiency. It is also

essential to note that the dataset for this study was retrieved in November 2024. Because indexing delays are common in large academic databases such as Scopus, late-year publications may not yet be included (Elsevier, 2023). Consequently, the total for 2024 may represent only a partial count of the full body of research produced that year, and future updates could reveal a higher volume of publications, which is important for interpreting the apparent trends and understanding potential gaps in the reported data.

RQ2. Who are the most relevant authors who contributed to the EFL vocabulary studies throughout the past decade?

In this section of the data analysis, the top 10 authors contributing most to the EFL vocabulary topic are shown, along with their production over time. The detailed research conducted by the relevant authors is shown in Figure 3 and Table 3.

Hassan Soodmand Afshar and Qun Wu are leading researchers in this category, each having published 3 articles over the past decade. Hassan

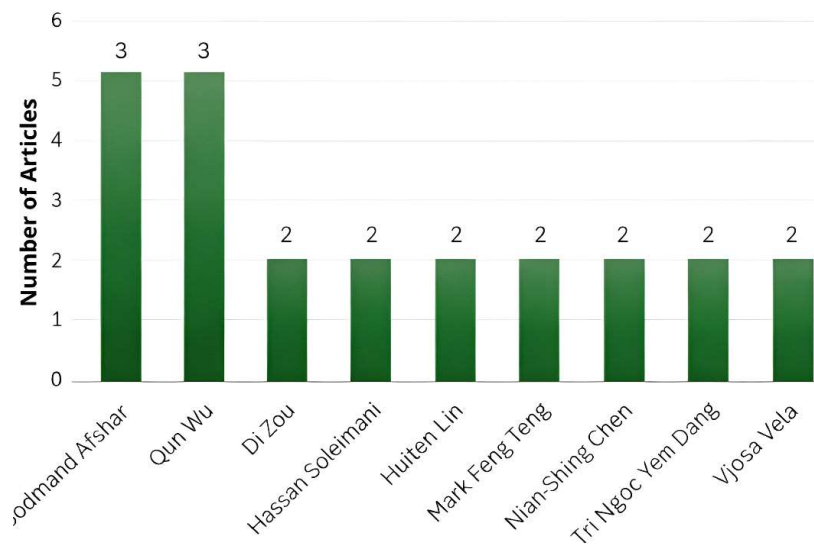


Figure 3. Chart of the most relevant authors

Soodmand Afshar's research mainly focuses on findings on conventional approaches to EFL vocabulary, while Qun Wu's research mostly focuses on the use of technology in acquiring EFL vocabulary. One of the most recent studies by Hassan Soodmand Afshar, entitled "Task-related focus-on-forms foreign language vocabulary development: Focus on spoken form and word parts," investigated the role of task-related activities (FonFs) in enhancing EFL vocabulary learning. In a study comparing three groups with varying instructional methods, the results showed that combining meaning-focused teaching with FonF activities led to the highest vocabulary

acquisition, with participants paying attention to pronunciation and word parts. This research also identified an approach that boosted learners' confidence and facilitated deeper vocabulary processing. Afshar's recent study on EFL vocabulary learning stands out because it tackles a topic that rarely examined yet critically needed.

One of Qun Wu's studies in 2014, titled "Learning ESL Vocabulary with Smartphones," explored the use of a smartphone application called World Learning to enhance 50 ESL Chinese college students. The application contains 852 English words, each with details such as spelling, pronunciation, Chinese

Table 3. Table of the most relevant authors and the article titles

Author	Number of Articles	Title
Hassan Soodmand Afshar	3	<ol style="list-style-type: none"> 1. “A Comparison of Iranian EAP Students and EFL Majors on the Use of Vocabulary Learning Strategies” (2014) 2. “An Evaluation of Grammar and Vocabulary Consciousness-raising Activities in Current ELT Materials” (2014) 3. “Task-related focus-on-forms foreign language vocabulary development: Focus on spoken form and word parts” (2021)
Qun Wu	3	<ol style="list-style-type: none"> 1. “Learning ESL Vocabulary with Smartphones” (2014) 2. “A Rote Strategy in Memorizing Vocabulary for ESL Learners” (2014) 3. “Designing a smartphone app to teach English (L2) vocabulary” (2015)
Di Zou	2	<ol style="list-style-type: none"> 1. “Balancing cognitive complexity and gaming level: Effects of a cognitive complexity-based competition game on EFL students' English vocabulary learning performance, anxiety, and behaviors” (2020) 2. “Learner engagement in digital game-based vocabulary learning and its effects on EFL vocabulary development” (2023)
Hassan Soleimani	2	<ol style="list-style-type: none"> 1. “Explicit Instruction of Context-embedded Hyperlinked Thematic Words and Vocabulary Recall” (2014) 2. “A Revisit To Vocabulary Acquisition In Involvement Load Hypothesis” (2015)
Huifen Lin	2	<ol style="list-style-type: none"> 1. “Effectiveness of Interactivity in a Web-based Simulation Game on Foreign Language Vocabulary Learning” (2015) 2. “The effect of the inductive and deductive data-driven learning (DDL) on vocabulary acquisition and retention” (2019)
Mark Feng Teng	2	<ol style="list-style-type: none"> 1. “Incidental L2 vocabulary learning from viewing captioned videos: Effects of learner-related factors” (2022) 2. “Working memory and prior vocabulary knowledge in incidental vocabulary learning from listening, reading, reading-while-listening, and viewing captioned videos” (2024)
Nian-Shing Chen	2	<ol style="list-style-type: none"> 1. “The effects of Embodiment-based TPR approach on student English vocabulary learning achievement, retention, and acceptance” (2014) 2. “Enhancing EFL vocabulary learning with multimodal cues supported by an educational robot and an IoT-Based 3D book” (2022)
Thi Ngoc Yen Dang	2	<ol style="list-style-type: none"> 1. “Vocabulary in high-school EFL textbooks: Texts and learner knowledge” (2020) 2. “Vocabulary in EAP learning materials: What can we learn from teachers, learners, and corpora?” (2022)
Vjosa Vela	2	<ol style="list-style-type: none"> 1. “Using Glosses for Incidental Vocabulary Acquisition”

		2. "The Effect of Keeping Vocabulary Notebooks on Vocabulary Acquisition and Learner Autonomy" (2016)
Wen-Ta Tseng	2	1. "Measuring English vocabulary size via computerized adaptive testing" (2016) 2. "Vocabulary learning in virtual environments: Learner autonomy and collaboration" (2020)

meanings, synonyms, antonyms, part of speech, and examples of sentence usage. Pre-test and post-test showed that the experimental group using the app performed significantly better than the control group. Di Zou, with 2 publications, ranked third among other authors in this topic. Zou's work demonstrates a sustained focus on digital game-based vocabulary learning in EFL contexts. Zou's 2020 article investigates how cognitive complexity and gaming difficulty influence learners' vocabulary performance, anxiety, and behavioral patterns. Zou's 2023 publication builds on this line of research by examining how learner engagement in digital games contributes to vocabulary development, underscoring the importance of interactive learning environments.

Hassan Soleimani is the fourth most relevant author who contributed 2 publications to this topic. Soleimani's 2014 work examines explicit instruction through context-embedded hyperlinked thematic words and its influence on vocabulary recall. Soleimani's 2014 article revisits the Involvement Load Hypothesis, analyzing how task-induced cognitive engagement affects vocabulary acquisition. These contributions highlight Soleimani's emphasis on cognitive involvement and structured instructional design in vocabulary learning. Huifen Lin, who produced 2 studies, is the fifth-most-relevant author in this topic. Lin's 2015 study evaluates the impact of interactivity in web-based simulation games on foreign language vocabulary learning, emphasizing learner-system engagement. Lin's 2019 publication compares inductive and deductive data-driven learning (DDL)

approaches to understand their effects on vocabulary acquisition and retention. Lin's research consistently demonstrates the value of interactive and corpus-informed methods in vocabulary instruction.

Mark Feng Teng ranked sixth among the most relevant authors in EFL vocabulary, with 2 studies. Teng's 2022 work investigates incidental vocabulary learning from captioned videos, focusing on learner-related factors that shape learning outcomes. Teng's 2024 publication extends this focus by exploring how working memory and prior vocabulary knowledge interact with various input modes, including listening, reading, and viewing. Teng's contributions foreground the role of cognitive resources and input modality in vocabulary development. Nian-Shing Chen, the seventh-most-relevant author on the list, is credited with completing two studies in the field. Chen's 2014 study evaluates the embodiment-based Total Physical Response approach, examining its effects on vocabulary achievement, retention, and learner acceptance. Chen's 2022 work integrates educational robotics and IoT-based 3D books to explore how multimodal cues enhance vocabulary learning. These publications highlight Chen's commitment to multisensory and technology-enhanced approaches in vocabulary instruction.

Thi Ngoc Yen Dang is the eighth-most-relevant author in the EFL vocabulary topic, with 2 publications. Dang's 2020 research analyzes vocabulary representation in high school EFL textbooks and compares it with learners' vocabulary knowledge. Dang's 2022 publication extends this analysis to EAP learning materials,

drawing on insights from teachers, learners, and corpus data. These works illuminate Dang's focus on the alignment between curricular materials and learners' vocabulary development. Next is the ninth-most-relevant author, Vjosa Vela, who has two relevant studies included in this analysis. Vela's 2015 study investigates how glosses support incidental vocabulary acquisition by enhancing textual input. Vela's 2016 work examines the effects of keeping vocabulary notebooks on vocabulary learning and learner autonomy. These contributions emphasize learner-generated strategies and student-driven approaches to vocabulary growth.

The last author ranked among the top 10 most relevant authors is Wen-Ta Tseng, who appears in the dataset with two publications. Tseng's 2016 article focuses on computerized adaptive testing as a method of assessing English vocabulary size. Tseng's 2020 study explores vocabulary learning in virtual environments, emphasizing the roles of learner autonomy and collaboration. Tseng's publications bridge vocabulary assessment and technology-enhanced learning, contributing to both measurement and instructional perspectives. The collective work of these authors reflects a multifaceted progression in EFL vocabulary research, showing how the field integrates technological, pedagogical, and cognitive perspectives. Studies by Wu, Zou, Lin, Chen, and Tseng demonstrate the growing impact of digital tools, multimodal environments, and virtual platforms on vocabulary learning. Meanwhile, research by Afshar, Soleimani, Dang, and Vela emphasizes instructional design, learning materials, and learner-directed strategies as essential components of vocabulary development. Together with Teng's focus on cognitive factors, these contributions illustrate how EFL vocabulary learning continues to evolve through the combined influence of technology, pedagogy, and learner characteristics.

The co-authorship map in Figure 4 indicates that research on EFL vocabulary is predominantly conducted by individual scholars or small, stable research teams rather than through extensive collaborative networks. Most authors appear as isolated nodes or are connected to only one or two co-authors, suggesting that collaboration in this field is limited and often localized. Several authors, such as Di Zou, Huifen Lin, Nian-Shing Chen, and Mark Feng Teng, form small clusters that reflect repeated collaboration within specific research groups, often centered on particular themes such as technology-enhanced learning or vocabulary acquisition processes. However, these clusters remain weakly connected, indicating minimal collaboration across research teams or institutions. This pattern suggests that EFL vocabulary research develops through multiple parallel strands of inquiry, promoting thematic diversity but limiting the integration of perspectives across the broader research community.

RQ3. What are the keyword trends on EFL vocabulary topics for the past decade?

The most relevant words are those that best reflect the authors' research. These words can mark the most important words that are essential and relevant to the topic of contextual EFL vocabulary enhancement. The chart of the most appropriate words from Biblioshiny-R is shown in Figure 5. Of the 117 articles analyzed by the Biblioshiny-R tool, the most frequent word is "vocabulary," with 17 occurrences. This keyword makes sense for this topic, as it is focused on vocabulary learning. Following the same reason, the second most frequent word is "vocabulary learning" with 16 occurrences. The third-most-used word is "EFL" (English as a Foreign Language), with 12 occurrences. This word is also highly important, as this study focuses on EFL, and no research on EFL vocabulary learning was included. Following keywords found with

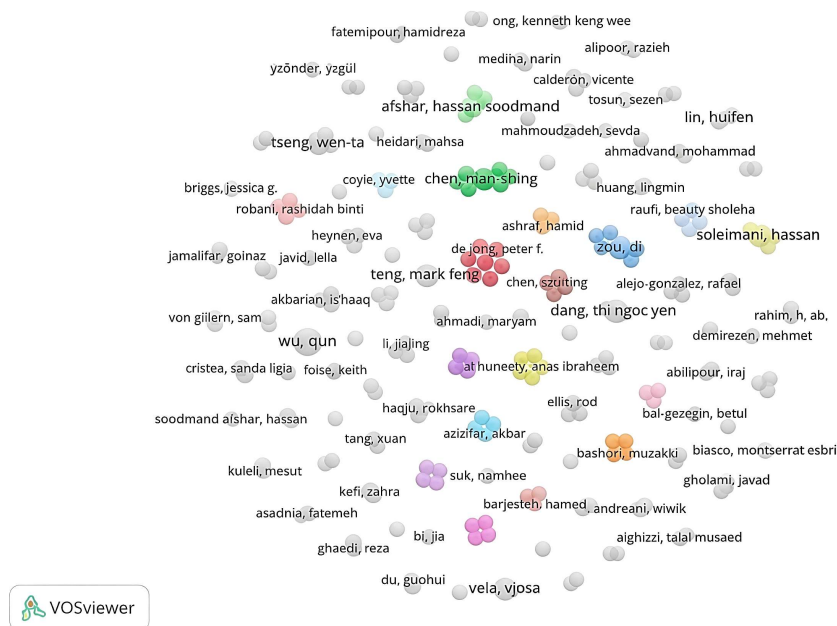


Figure 4. Co-Authorship map of authors in EFL vocabulary

both occurrences is 6 times are “incidental vocabulary learning” and “vocabulary size”, both “academic vocabulary” and “vocabulary acquisition” each with five occurrences, and “EFL learners”, “English as a foreign language”, and “L2 vocabulary learning” each with four occurrences.

In addition to using Biblioshiny-R, VOSviewer was used to obtain links to the most frequently used keywords in these articles.

VOSViewer can read 47 of the most frequent words, as shown in Figure 7. From those 47 items, 9 clusters, and 95 links can be found. Item means the keywords that the VOSViewer finds, cluster means words that are closely related and often appear together, and link means the connection between a word and other words. In the visualization link in Figure 6, “vocabulary” and “EFL” were the largest words in the cluster, indicating that they are frequently used.

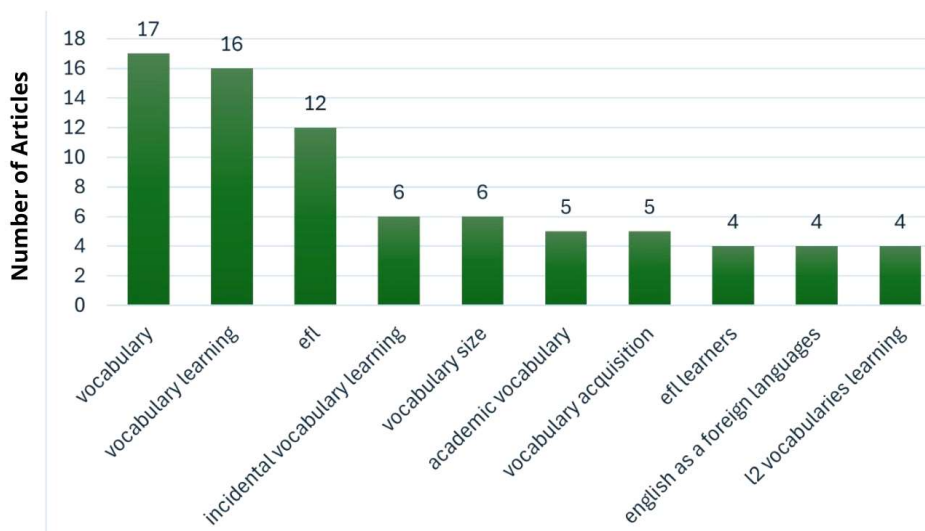


Figure 5. Chart of the most relevant keywords

proficiency and literacy development, often explored through strategy use, instructional design, and learner engagement. Closely linked to this core is the red cluster, organized around “vocabulary acquisition,” “learner autonomy,” and “virtual environment,” which signals a growing emphasis on learner-centered approaches. Research in this area increasingly conceptualizes vocabulary learning as an active and self-regulated process, supported by task design, interactive environments, and learner control over learning conditions.

Surrounding these core themes are clusters that reflect methodological expansion and technological integration in EFL vocabulary research. The blue and light orange clusters, characterized by “corpus,” “data-driven learning,” and “concordance,” highlight the rise of corpus-informed pedagogy and inductive learning approaches that encourage learners to discover lexical patterns through authentic language data. In parallel, the orange and dark

green clusters, associated with “digital game-based learning,” “incidental vocabulary learning,” “exposure,” and “vocabulary development,” illustrate the increasing prominence of technology-mediated environments, including mobile applications, games, simulations, and audiovisual input. These strands suggest a shift toward engagement-driven and experimental learning models, where vocabulary development occurs through interaction and meaningful exposure rather than memorization alone. Finally, the light green and gray clusters, encompassing “vocabulary size,” “vocabulary breadth,” “assessment,” and the psychometric term “Rasch model,” reflect a growing concern with measurement precision and empirical validation. Together, these clusters indicate a thematic evolution in EFL vocabulary research, moving from predominantly instructional and strategy-based perspectives toward integrated frameworks that combine cognitive depth, technological accessibility, and firm assessment practices.

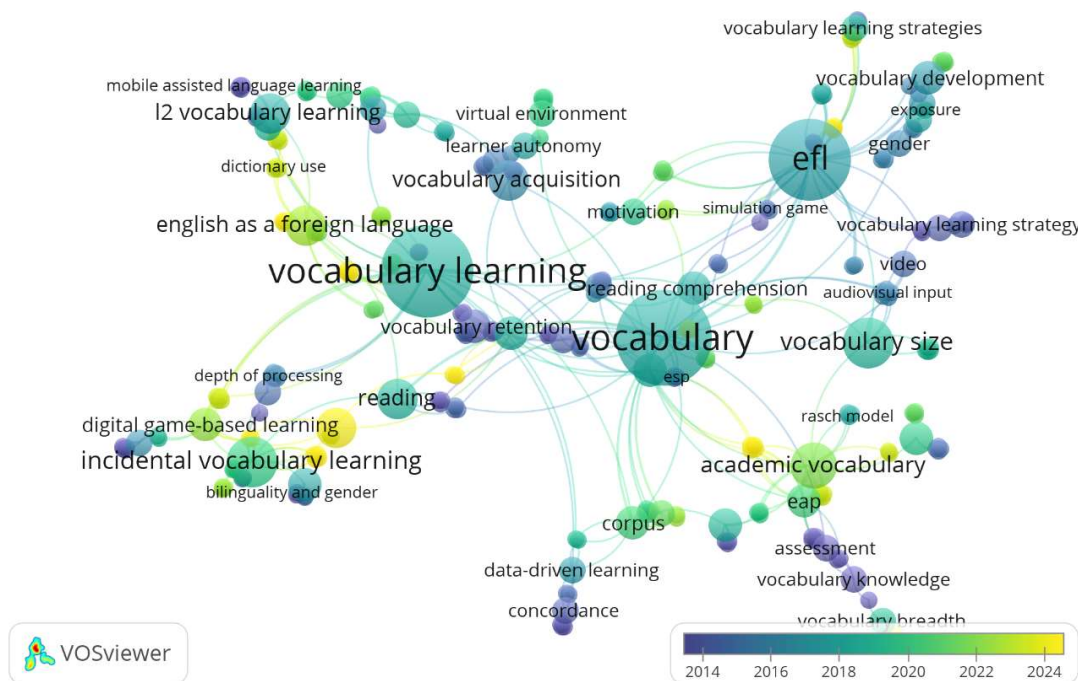


Figure 8. VOSviewer overlay visualization of most relevant keywords

The overlay visualization (Figure 8) reveals a clear temporal evolution in EFL vocabulary research over the past decade. Core concepts such as “*vocabulary*,” “*vocabulary learning*,” “*English as a foreign language*,” “*reading*,” and “*vocabulary retention*” appear in darker blue, indicating their long-standing and foundational roles in the field. Keywords that emerge in greener hues, including “*academic vocabulary*,” “*vocabulary size*,” “*assessment*,” and “*corpus*,” suggest a growing mid-period emphasis on measurement, evaluation, and academically oriented lexical competence. More recent research trends, reflected in yellowish tones, highlight increasing attention to “*digital game-based learning*,” “*incidental vocabulary learning*,” “*video*,” “*audiovisual input*,” “*mobile-assisted language learning*,” and learner-related variables such as “*exposure*” and “*gender*.” Overall, the visualization demonstrates a gradual shift toward technology-enhanced, multimodal, and learner-centered approaches, while maintaining strong conceptual links to the field’s established theoretical foundations.

RQ4. What are the most globally cited documents in EFL vocabulary topics throughout the past decade?

These are the studies that contributed most to subsequent EFL vocabulary research,

according to the Scopus database. Table 5 shows that 17 studies were cited in other research more than once. These studies are used by subsequent researchers after publication as sources of their data or as supporting data for their research. The chart and table show that the most globally cited document is a study by Montserrat Esbrí Blasco that was cited 15 times, with the study titled “*A Cognitive Linguistic Analysis of the Cooking Domain and its Implementation in the EFL Classroom as a Way of Enhancing Effective Vocabulary Teaching*” (2015). Followed by a study from Blanka Klimova with a 12 times cited title “*Evaluating Impact of Mobile Applications on EFL University Learners’ Vocabulary Learning – A Review Study*” (2021). The third-most-cited document, with 7 citations, is a study by H.M. Sidek titled “*The Role of Vocabulary Knowledge in Reading Comprehension: A Cross-Linguistic Study*” (2015). More detailed information on the most globally cited document titles is presented in Table 5.

The most cited documents collectively reveal strong theoretical and methodological patterns that help explain their impact within EFL vocabulary research. Theoretically, these studies converge on clarifying how vocabulary is learned and which mechanisms best support learners in EFL contexts. Cognitive-oriented works such as

Table 4. Most globally cited documents

Paper	Total Citations
Montserrat Esbrí Blasco MEB, 2015, <i>Procedia-Social and Behavioral Sciences</i>	15
Blanka Klimova BK, 2021, <i>Procedia Computer Science</i>	12
H.M. Sidek HMS, 2015, <i>Procedia-Social and Behavioral Sciences</i>	7
Recep Bilican RB, 2015, <i>Procedia-Social and Behavioral Sciences</i>	7
Sanda Ligia Cristea SLC, 2015, <i>Procedia-Social and Behavioral Sciences</i>	6
Adibah Halilah Binti A. Mutalib AHAM, 2014, <i>Procedia-Social and Behavioral Sciences</i>	6
Enes Yilmaz EY, 2015, <i>Procedia-Social and Behavioral Sciences</i>	6
Narin Mediha NM, 2014, <i>Procedia-Social and Behavioral Sciences</i>	5
Huifen Lin HL, 2015, <i>Procedia-Social and Behavioral Sciences</i>	4
Wiwik Andreani WA, 2019, <i>Procedia Computer Science</i>	4

Betül Bal-Gezegin BBG, 2014, <i>Procedia-Social and Behavioral Sciences</i>	3
Qun Wu QW, 2014, <i>Procedia-Social and Behavioral Sciences</i>	3
Qun Wu QW, 2014, <i>Procedia-Social and Behavioral Sciences</i>	3
Farzad Mashhadi FM, 2015, <i>Procedia-Social and Behavioral Sciences</i>	2
Marzieh Sharifi MS, 2015, <i>Procedia-Social and Behavioral Sciences</i>	2
Zahra Hashemi ZH, 2015, <i>Procedia-Social and Behavioral Sciences</i>	2
Hassan Soleimani HS, 2015, <i>Procedia-Social and Behavioral Sciences</i>	2
Yusuf Şen Y, 2015, <i>Procedia-Social and Behavioral Sciences</i>	1
Sezen Tosun ST, 2015, <i>Procedia-Social and Behavioral Sciences</i>	1
Aslihan Emirmustafaoglu AE, 2015, <i>Procedia-Social and Behavioral Sciences</i>	1
Vjosa Vela VV, 2015, <i>Procedia-Social and Behavioral Sciences</i>	1

Table 5. Top 10 paper titles of the most globally cited documents

Author	Citations	Paper Title
Montserrat Esbrí Blasco	15	“A Cognitive Linguistic Analysis of the Cooking Domain and its Implementation in the EFL Classroom as a Way of Enhancing Effective Vocabulary Teaching” (2015)
Blanka Klimova	12	“Evaluating Impact of Mobile Applications on EFL University Learners’ Vocabulary Learning – A Review Study” (2021)
H. M. Sidek	7	“The Role of Vocabulary Knowledge in Reading Comprehension: A Cross-Linguistic Study” (2015)
Recep Bilican	7	“Self-regulated Capacity for Vocabulary Learning in Turkish High School Students: An Experimental Study” (2015)
Sanda Ligia Cristea	6	“Investigating Romanian EFL Students’ Perceptions Regarding the Effectiveness of Vocabulary Activities” (2015)
Adibah Halilah Binti A. Mutalib	6	“Vocabulary Learning Strategies among Malaysian TEVT Students in German-Malaysian Institute (GMI)” (2014)
Enes Yilmaz	6	“The use of Concordance for Teaching Vocabulary: A Data-driven Learning Approach” (2015)
Narin Mediha	5	“A Comparative Study on the Effectiveness of Using Traditional and Contextualized Methods for Enhancing Learners’ Vocabulary Knowledge in an EFL Classroom” (2014)
Huifen Lin	4	“Effectiveness of Interactivity in a Web-based Simulation Game on Foreign Language Vocabulary Learning” (2015)
Wiwik Andreani	4	“‘PowPow’ interactive game in supporting English vocabulary learning for elementary students” (2019)

The most cited documents collectively reveal strong theoretical and methodological patterns that help explain their impact within EFL vocabulary research. Theoretically, these studies converge on clarifying how vocabulary is learned and which mechanisms best support learners in EFL contexts. Cognitive-oriented works such as

Blasco’s (2015) cognitive linguistic analysis and Sidek’s (2015) cross-linguistic examination of vocabulary and reading strengthen understanding of how conceptual structure, lexical depth, and cross-language transfer influence vocabulary development. To build on this foundation, studies by Bilican (2016) and Mutalib (2014) on learning

strategies and self-regulation contribute to theories of learner autonomy and metacognitive engagement by showing that long-term vocabulary progress depends not only on instructional input but also on how learners manage their own learning behaviors. In addition, corpus and data-driven learning research, such as Yilmaz's (2015) concordancing study, provides theoretical grounding for the role of authentic language evidence in effective vocabulary teaching. Technology-focused works, including Klimovas's (2021) review of mobile learning, Lin's (2015) study of an interactive simulation game, and Andreani's (2019) elementary-level game-based intervention, further extend these theoretical insights by demonstrating how digital environments influence attention, engagement, and incidental vocabulary acquisition.

From a methodological perspective, these influential publications share approaches that produce practical, transferable, and empirically grounded findings. Review studies such as Klimova (2021) gain high citation impact because they synthesize a large body of evidence, identify recurring patterns, and help guide future research agendas. Experimental and quasi-experimental designs, which appear in the works of Bilican (2015), Mediha (2014), and Lin (2015), allow researchers to test instructional methods through measurable vocabulary gains, making their findings particularly useful for EFL classrooms. Perception-based studies, such as those by Cristea (2015), contribute to ecological validity

by capturing how learners experience vocabulary activities in authentic educational contexts. Corpus-oriented, data-driven learning studies, such as Yilmaz (2015), provide objective linguistic evidence to inform instructional decisions. When combined, these diverse methods provide a balanced and interconnected body of knowledge in which controlled experiments establish causal insights, corpus studies anchor instruction in real language use, perception research reflects learner needs, and review studies map broader disciplinary trends. Together, these theoretical and methodological contributions help explain why these documents have become highly cited; they not only deepen conceptual understanding of vocabulary learning in EFL settings but also offer concrete pedagogical models that teachers and researchers can apply directly.

For a more compact analysis of the most globally cited documents, the most relevant authors will be linked to them. The purpose of this is to see if the most relevant authors, with the most contributions of writing articles related to the EFL vocabulary topic, are also contributing to making articles that are reliable and relevant enough to be the most cited documents. The analysis of the connection between the most relevant authors and the most globally cited documents is shown in Table 6. The table lists the most relevant authors whose studies appear on the list of the most globally cited documents.

Table 6. Most cited documents by most relevant authors

Author	Author Rank	Cited Rank	Cited Amount	Paper Title
Huifen Lin	5th	9th	4	"Effectiveness of Interactivity in a Web-based Simulation Game on Foreign Language Vocabulary Learning" (2015)
Qun Wu	2nd	12th	3	"Learning ESL Vocabulary with Smartphones" (2014)
		13th	3	"A Rote Strategy in Memorizing Vocabulary for ESL Learners" (2014)

Hassan Soleimani	4th	17th	2	“A Revisit To Vocabulary Acquisition In Involvement Load Hypothesis” (2015)
Vjosa Vela	9th	21st	1	“Using Glosses for Incidental Vocabulary Acquisition” (2015)

The first most relevant author in the most cited list is Huifen Lin (2015), with the research title “Effectiveness of Interactivity in a Web-based Simulation Game on Foreign Language Vocabulary Learning,” and was cited 4 times. This study by Huifen Lin aims to answer how interactivity in a web-based simulation game affects vocabulary learning and retention among Asian EFL learners. The research showed that multiplayer interactivity boosted meaningful cognitive engagement and significantly improved vocabulary knowledge. This study is quite general and can be appropriately adapted to several research topics that are related to the use of digital gamification in the EFL vocabulary field. Qun Wu, the second-most-productive author in the EFL vocabulary field, had two of their studies among the most globally cited documents, each cited 3 times. Followed by the fourth-most-relevant author, Hassan Soleimani, with one of his studies cited 2 times. The last relevant author is Vjosa Vela, with 1 cited document. Intriguingly, the most relevant author did not appear in the most globally cited documents, but this may be because Afshar’s research is very specific and rarely cited.

■ **CONCLUSION**

This study provides an important renewal in EFL vocabulary research by offering an updated and comprehensive bibliometric analysis of 117 Scopus-indexed documents published between 2014 and 2024, addressing a gap created by years of limited consolidation in this field. The findings highlight several key thematic patterns, including the rising prominence of technology-enhanced vocabulary learning, the growing use of corpus-informed and data-driven approaches, and the sustained attention to

cognitive and strategic factors that shape vocabulary development. These patterns reflect a broader paradigm shift from traditional, textbook-centered vocabulary instruction toward more interactive, empirically grounded, and learner-centered pedagogies. By identifying influential authors, mapping dominant keywords, tracing publication trends, and analysing highly cited works, this study not only clarifies how EFL vocabulary research has evolved but also offers a structured foundation for future investigations. Overall, the contributions of this research lie in its ability to synthesize fragmented developments, reveal emerging directions, and provide a renewed reference point for scholars seeking to advance the study of vocabulary within EFL contexts.

Several challenges were encountered during data collection, mainly due to the limitations of the search process and the use of a single database. The initial Scopus search using the query “EFL vocabulary” retrieved 3,421 documents, yet only a small portion were truly relevant, requiring extensive manual screening, resulting in 117 eligible articles after the PRISMA procedure. Reliance on a single query without Boolean operators reduced search precision and may have excluded studies that used different terminology, suggesting that future research should use more comprehensive search strings. In addition, using Scopus as the sole data source limits both the validity and the reliability of the findings, as relevant studies indexed in databases such as Web of Science or Taylor & Francis may not have been captured. Despite these constraints, the result of this study can still serve as a helpful foundation and reference point for future investigations into EFL vocabulary research.

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