Bibliometric Evaluation of Publications on Second Language Vocabulary Acquisition (2000-2024)

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Abstract

While extensive research has explored Second Language Vocabulary Acquisition (SLVA) acquisition, there has been a lack of comprehensive bibliometric analysis on this topic. This study addresses this gap by investigating research trends and collaboration networks in SLVA over the past 24 years. Publications on SLVA were retrieved and analysed using data extracted from the Web of Science, a widely-used research database. Using CiteSpace software, we analysed bibliographic details, including countries, institutions, authors, and keywords, and created interactive visualizations. A total of 3905 publications were identified as of April 2, 2024. The United States led in productivity with 1079 publications, while Radboud University Nijmegen was the most prolific institution with 55 publications. Stuart Webb emerged as the most active author, contributing 29 publications. 'Vocabulary' was the most frequent keyword, appearing 1033 times, highlighting its centrality in research developments. The analysis of scientific network maps and keywords revealed significant changes and emerging trends in SLVA research. These results provide meaningful insights and highlight several promising avenues for future exploration in SLVA research.

Keywords: *Second Language, Vocabulary Acquisition, Bibliometric Evaluation, Citespace*

Introduction

Research has established that the development of a robust vocabulary is central to the acquisition of English proficiency. Scholars have increasingly focused on vocabulary acquisition due to its recognized importance (Akpınar et al., 2015; Milton, 2009). Vocabulary

knowledge forms the foundation of English language learning, influencing reading comprehension, speaking ability, and overall communicative competence (Puteri & Soleha, 2023; Thiendathong & Sukying, 2021). It supports both the production and interpretation of language, enabling effective communication. Vocabulary size is essential for second language learners, as it significantly influences their ability to perform in core language skills such as listening, speaking, reading, and writing. (Richards & Renandya, 2002). Despite its importance, there remains a noticeable gap in bibliometric analyses focusing on studies of vocabulary acquisition.

Since the 1960s, vocabulary acquisition has undergone substantial advancements, including an expanded scope, contributions to linguistic theory, and the emergence of various theories shaping experimental studies (Ellis et al., 2008). Vocabulary has become a central focus in modern applied linguistics, with articles on vocabulary teaching consistently outnumbering those on other topics. This trend highlights the growing prominence of vocabulary acquisition and instruction within the field.

As highlighted by Nation (2018), over the last 12 years, more than 30 percent of studies on vocabulary learning, including first language (L1) learning and second language (L2) learning, has been conducted, marking a significant shift in the field. Vocabulary plays a vital role in language learning, yet it remains one of the most difficult aspects of second language acquisition for many learners. To support vocabulary acquisition, a variety of vocabulary learning strategies (VLS) have been explored, including both explicit and implicit methods (Calafato & Clausen, 2024; Hakem, 2022; Mohammed, 2023).

Research in vocabulary acquisition has evolved from being largely descriptive to increasingly theoretical in nature (Gass, 2009). This shift suggests that the field is becoming more multifaceted and expansive. Furthermore, another key indicator of development is the scale of the research output. The past two decades have witnessed that a surging number of related research papers have been published in leading journals in the field of language research. This rapid growth can be credited to the efforts of many scholars whose extensive publications have greatly enhanced our understanding of Second Language Vocabulary Acquisition (SLVA). However, as the field has matured, defining its core focus has become more challenging. One approach to address this complexity is to conduct a bibliometric analysis, which involves evaluating a large volume of publications to uncover systematic patterns and trends. This quantitative method can offer valuable insights into the research impact, emerging topics, key authors, and collaborative networks within the discipline.

According to Pritchard (1969), the term bibliometrics refers to the use of mathematical and statistical techniques applied to books and various forms of communication. Essentially, bibliometrics is a quantitative approach that investigates publication patterns, which can help readers gain more understanding into a field by analysing its characteristics such as publication dates, locations, citation trends, and the relationships between sources (Bellis, 2009). This method has been extensively utilized to evaluate the influence of publication platforms, geographic regions, research organizations, authors, as well as academic literature, providing valuable information for scholars, educators, students, librarians, and funding bodies (Holden et al., 2005). When used alongside network mapping methods, bibliometrics can pinpoint central themes within a field (Bellis, 2009), enabling researchers to evaluate the breadth of a research area (Chang et al., 2015). Furthermore, by considering temporal trends, bibliometrics

can uncover emerging topics and assist academics in planning and guiding future research directions (Bichteler & Eaton, 1980).

CiteSpace V, developed by Professor Chen at Drexel University, is a Java-based software tool designed for bibliometric analysis (available at http://cluster.ischool.drexel.edu/~cchen/citespace/download/) (Chen, 2006). This tool visualizes large datasets through knowledge maps, allowing researchers to gain an intuitive understanding of the development trajectory of a field and identify emerging patterns (Chen, 2004; Chen, 2006). Recently, CiteSpace has been employed in bibliometric studies across various disciplines, including language and literature (Nederhof, 2011), child language (Guo, 2022), general language research (Zhang et al., 2020), and linguistics (Cheshmehsohrabi & Mashhadi, 2022).

This study primarily utilizes the CiteSpaceV software, a tool for mapping scientific knowledge, to organize and analyse relevant literature in the field of SLVA over the past 24 years. Further, it objectively describes the development status, research content, research methods, research trends, and research hotspots of vocabulary acquisition. This paper provides scientific enlightenment for the future development of vocabulary acquisition research. The remaining sections in this paper includes a description of materials for this bibliometric analysis, the analytical methods, results of the analysis, and the discussion. The paper ends with a conclusion and suggestions for future researchers.

As far as we know, this study is the first to apply bibliometric analysis to explore trends in SLVA by examining literature published between 2000 and 2024. The aim is to offer an overview of the evolution, impact, and future developments of SLVA research over the past 20 years. By using bibliometric methods, we seek to identify significant patterns, influential studies, and emerging themes in this specialized field. This analysis not only highlights the progress in SLVA but also provides valuable insights into its research trajectory and its broader contributions to the field.

Materials and Methods

Bibliometric Database

This study utilized bibliometric data obtained from the Web of Science (WoS), which is among the primary online databases for bibliometric analysis and recognized as one of the most reputable and commonly used resources (Roemer & Borchardt, 2015). It is a popular and authoritative database, particularly strong in the research fields of medicine and the natural sciences. Many previous studies have also chosen WoS as their data source due to its reliability (Chen et al., 2012; Ellegaard & Wallin, 2015).

Inclusion Criteria

Figure 1 presents the inclusion criteria. The search terms include the following expressions ('L2 vocabulary acquisition', 'L2 vocabulary learning', 'L2 vocabulary learner*', 'second language vocabulary acquisition', 'second language vocabulary learning', 'second language vocabulary learner*', '2nd language vocabulary acquisition', '2nd language vocabulary learning', '2nd language vocabulary learner*'). Only articles and reviews were considered for inclusion, while meeting abstracts, letters and other types of documents, were not included. The selected database was the Web of Science Core Collection, spanning from January 1st,

2000, to April 1st, 2024. The indices used were the Science Citation Index Expanded (SCI-EXPANDED), Emerging Sources Citation Index (ESCI), and the Arts & Humanities Citation Index (A&HCI). Publications were restricted to those in English, with no further language limitations. Since no human or animal subjects were involved in this study, it is unnecessary to require an ethical statement. Ultimately, a sum of 4,541 records met the inclusion criteria.

Analytical Methods

The objective of this study was to apply CiteSpace software for an in-depth bibliometric analysis of published research on SLVA from 2000 to 2024. This analysis offered a comprehensive view of the research trends, prominent themes, and influential studies that have defined the SLVA field over the past two decades. By using CiteSpace, we systematically identified and visualized patterns within the literature, including highly cited works, the progression of research topics, and the co-citation relationships among key researchers.

The study also determined the publishing model preferences within the SLVA community, including the types of journals and open access trends. Additionally, we examined the identities and contributions of prominent authors in the field, shedding light on the leading scholars and collaborative networks that shaped the discourse on SLVA. By examining the evolution of research themes and citation patterns over time, this study offered valuable insights into existing trends and possible future development in SLVA research. Ultimately, this bibliometric analysis enhanced our understanding of the scholarly landscape in SLVA and identified areas that remain ripe for further investigation.

Figure 1
Literature Retrieval Flow Chart
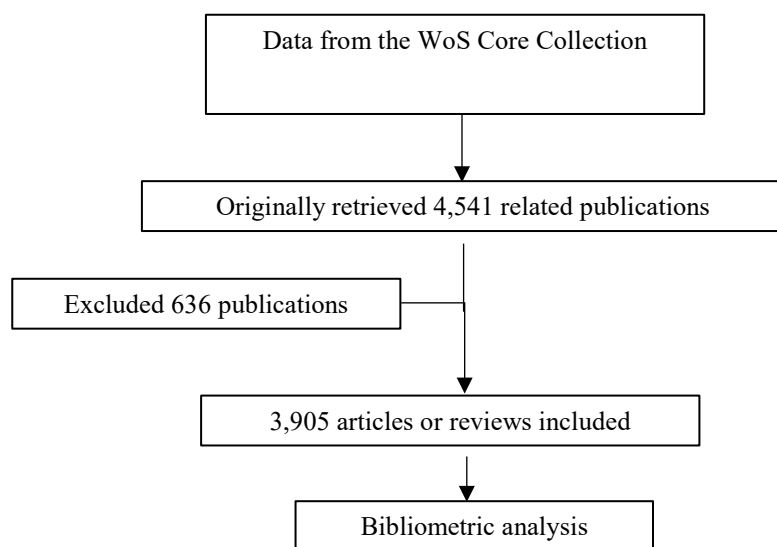
All publications retrieved from the database were imported into bibliometric software tools, including VOSviewer 1.6.16, CiteSpace 5.8. R3, and R-Studio 3.2.11, to conduct visual analyses. Some key information of these publications, such as their countries, institutions, authors, and keywords, were examined. Citation analysis, a key indicator of scientific performance, was used to assess the impact of publications, authors, and academic institutions

through citation metrics (Bellis, 2009). Due to their simplicity and ease of calculation, citation metrics are widely used by scholars, research institutions, and funding organizations.

Results

Distribution of Publication Output

This study included 3,905 publications, providing an extensive overview of research on SLVA from 2000 to 2024. The distribution of publications over the years showed notable fluctuations, indicating evolving trends and increasing interest in the field (refer to Figure 2). In the early 2000s, the number of publications was relatively modest, with only 16 papers published in 2000. This number remained relatively stable in the following years but began to show a gradual increase as the decade progressed. By the mid-2010s, interest in SLVA research intensified, resulting in a notable surge in published studies. The most significant growth occurred in the last decade, culminating in a remarkable 405 publications in 2023. This substantial increase indicates a heightened scholarly and practical interest in understanding and enhancing vocabulary acquisition for L2 learners.

The data analysis for this study was finalized on April 2, 2024, establishing a cut-off for the inclusion of the most recent publications. The upward trend observed in recent years indicates that SLVA has gained increasing prominence as a research hot topic within the larger field of language learning and applied linguistics. Several factors, including technological advancements in language learning, heightened awareness of vocabulary's role in language proficiency, and the global rise in multilingual education, have contributed to this surge in research. The results of this bibliometric analysis underscore the evolving essence of SLVA studies and identify key moments of growth and innovation in the field.
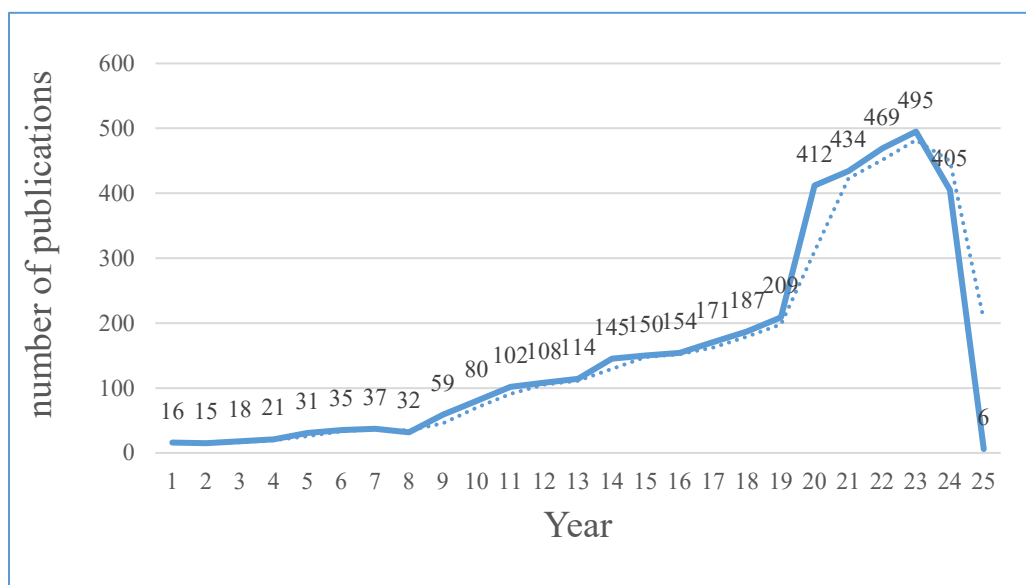
Temporal Distribution of Publications

In Figure 2, the horizontal axis tells the publication year, while the vertical axis shows the number of publications. The fluctuation in the number of published papers serves as an indicator of the development and direction within the SLVA research field. This visualization helps to track the fluctuations in the volume of publications over time.

Over the past 24 years, research on SLVA has shown an obvious upward trend (Figure 2). From the trend chart, we can clearly see that the research process of the past 24 years can be divided into two stages of development. In the first 16 years (2000-2018), 1,684 research papers were released, making up 43.12 % of the total number of papers. The next five years (2019-2023) are the second stage with an obvious upward trend. A total of 2,215 papers have been published in these five years, accounting for 56.72 % of the full count of related research articles. This phenomenon shows that the study of vocabulary acquisition has received more and more attention in recent years. Since the statistical time is April 1st, 2024, only four related articles were found.

Figure 2

Annual Number of Publications from 2000 to 2024

Distribution of Country and Institution

Table 1 presents the geographical distribution of SLVA research publications, showing notable contributions from different countries and regions. For clarity, research articles from Hong Kong, Macau, and Taiwan were grouped under China, and those from England, Scotland, Northern Ireland, and Wales were categorized under the UK. The United States emerged as the most productive country, boasting 1,079 publications, a reflection of its robust research infrastructure and strong commitment to applied linguistics research. Following the US, China contributed 374 publications, reflecting its growing role in the global academic landscape and its increasing focus on language education and acquisition. The United Kingdom was next, with 169 publications, showcasing its long-standing tradition of excellence in language research. Canada contributed 156 publications, reflecting its bilingual context and strong emphasis on language studies. Spain, with 120 publications, also made a notable contribution, highlighting its research interest in multilingualism and second language learning.

Table 1

Top 10 Prolific Countries

Rank	Country	Papers (%)
1	USA	1079（30.6%）
2	China	374（10.61%）
3	England	169（4.79%）
4	Canada	156（4.43%）
5	Spain	120（3.4%）
6	Japan	113（3.21%）
7	Germany	99（2.81%）
8	Netherlands	95（2.7%）
9	Belgium	66（1.87%）
10	Australia	55（1.56%）

Table 2

Top 10 Prolific Institutions

Rank	Institution	Publications	Country
1	Radboud University Nijmegen	55 (1.56%)	Netherlands
2	University of Toronto	51 （1.45%）	Canada
3	Victoria University of Wellington	46 （1.3%）	New Zealand
4	Michigan State University	44 （1.25%）	USA
5	Ghent University	42 （1.19%）	Belgium
6	University College London	42 （1.19%）	UK
7	The Education University of Hong Kong	41 （1.16%）	China
8	University of Hong Kong	36 （1.02%）	China
9	University of Oslo	36 （1.02%）	Norway
10	University of Western Ontario	33 （0.94%）	Canada

The analysis of institutional contributions, presented in Table 2, reveals the top academic institutions driving SLVA research. Radboud University Nijmegen emerged as the leading institution with 55 publications, indicating its prominent role in advancing SLVA knowledge and research initiatives. The University of Toronto followed closely with 51 publications, reflecting its robust research programs and emphasis on language acquisition. Victoria University of Wellington contributed 46 publications, underscoring its active engagement in the field despite its smaller size relative to other leading institutions. Michigan State University, with 44 publications, demonstrated significant contributions to the field, emphasizing its commitment to linguistic studies. Ghent University also made substantial contributions with 42 publications, highlighting its active research environment and focus on language acquisition.

These findings illustrate a diverse yet concentrated effort in SLVA research, with notable contributions from leading institutions across different countries. The varied geographical distribution can reflect the global relevance of SLVA, while the institutional data highlights the centres of excellence that are advancing research in this field. Collectively, this data offers a thorough summary of the SLVA research landscape, showcasing the key contributors and geographical trends that have shaped the development and dissemination of knowledge in SLVA.

Distribution of Authors

Table 3 reveals an analysis of the most prolific authors in SLVA research, underscoring the notable contributions of key scholars within this domain. Stuart Webb emerged as the most prolific author, with a total of 29 publications. Webb's research contributions, primarily affiliated with Canada, have significantly influenced the understanding and advancement of SLVA (Kim & Webb, 2023). His work often focuses on vocabulary acquisition strategies, the impact of diverse learning methods, and the impact of extensive reading on vocabulary growth, making him a leading figure in the field.

Table 3

Top 10 Prolific Authors

Rank	Author	Number of Publications	Country
1	Stuart Webb	29	Canada
2	Barry Lee Reynolds	19	China
3	Elke Peters	18	Belgium
4	Ludo Verhoeven	18	Netherlands
5	Johanne Paradis	17	Canada
6	Xi Chen	17	Canada
7	Haomin Zhang	16	China
8	Eliane Segers	15	Netherlands
9	Frank Boers	15	Canada
10	Kazuya Saito	15	Britain

Barry Lee Reynolds, with 19 publications, ranked second in the field. Based in China, Reynolds has contributed extensively to SLVA research, covering topics such as vocabulary learning and teaching strategies, assessment techniques, and the use of technology in vocabulary acquisition (Reynolds, 2022). His contributions reflect the expanding number of SLVA research coming from Asia, especially in the context of English language learning in non-native settings. In third place is Elke Peters from Belgium, with 18 publications. Peters' work contributes to our understanding of vocabulary learning processes, the impact of instructional approaches, and the role of linguistic and cognitive factors in vocabulary acquisition (Peters, 2009; Peters & Webb, 2018). Her research provides valuable insights into how new vocabulary are acquired and retained in a second language.

Ludo Verhoeven, also with 18 publications, represents the Netherlands. His research explores the cognitive and developmental aspects of language acquisition, including how vocabulary knowledge develops over time and across different linguistic contexts (Gruhn et al., 2023; van der Elst-Koeiman et al., 2023). Verhoeven's work is crucial for understanding the interplay between vocabulary and broader language skills. Johanne Paradis and Xi Chen, both from Canada, each have 17 publications. Paradis' research often investigates bilingualism and second language acquisition in children, focusing on vocabulary development among other language skills. Chen's work similarly emphasizes vocabulary development but with a particular interest in cross-linguistic influences and reading acquisition in bilingual and multilingual contexts.

Haomin Zhang, from China, contributed 16 publications. Zhang's research is noted for its focus on the pedagogical aspects of vocabulary teaching and the application of innovative instructional techniques in diverse educational settings. Eliane Segers from the Netherlands, with 15 publications, has made significant contributions to understanding the mechanisms of vocabulary learning, particularly in relation to digital and technological tools that support vocabulary acquisition.

Frank Boers, affiliated with Canada, also has 15 publications. His research often explores the pedagogical approaches to vocabulary teaching, including the effectiveness of metaphor and idiom instruction, and the influence of cognitive linguistics in vocabulary learning. Kazuya Saito, from Britain, completes the top ten with 15 publications. Saito's work frequently addresses the interface between vocabulary acquisition and pronunciation, as well as the implications of vocabulary knowledge for overall communicative competence in a second language. These authors, representing a diverse set of countries and research focuses, have

collectively advanced the field of SLVA through their prolific contributions. Their work has influenced theoretical perspectives, instructional practices, and our overall understanding of how second language learners acquire, retain, and use new vocabulary. This table reflects not only the individual achievements of these researchers but also highlights the international and interdisciplinary nature of SLVA research.

Distribution of Keywords

The co-occurrence map of keywords over time indicates the central themes of research (Chen et al., 2014; Miao et al., 2017). Table 4 shows the most frequently occurring keywords, including "vocabulary", "acquisition", "language", "English", "2nd English", "children", and "learner". Keywords that see frequent citation within a specific timeframe are considered indicators of emerging trends or frontier topics. Figure 3 shows the top 25 keywords with the strongest occurrence bursts, which signify a rapid increase in frequency and reflect shifts in research focus within the field (Chen et al., 2014; Chen et al., 2012).

Table 4

Top 20 Keywords Ranked by Frequency

Rank	Keyword	Frequency (%)
1	Vocabulary	1033 （5.29%）
2	Acquisition	946 （4.85%）
3	Language	708 （3.63%）
4	English	626 （3.21%）
5	2nd Language	552 （2.83%）
6	Children	447 （2.29%）
7	Learner	402 （2.06%）
8	Comprehension	401 （2.05%）
9	Knowledge	376 （1.93%）
10	Student	289 （1.48%）
11	Word	264 （1.35%）
12	Working Memory	251 （1.29%）
13	Reading Comprehension	240 （1.23%）
14	Skill	240 （1.23%）
15	Instruction	227 （1.16%）
16	Individual Difference	213 （1.09%）
17	Vocabulary Acquisition	212 （1.09%）
18	Proficiency	202 （1.03%）
19	bilingualism	194 （0.99%）
20	memory	185 （0.95%）

From a synchronic perspective, burst keywords are recognized as the cutting-edge areas of research during a specific time frame. In contrast, from a diachronic perspective, a keyword surge represents a new research hotspot. By detecting keyword bursts, we can gain insights into the focal research areas during a particular period. The red line in the figure marks the time period when the keyword experienced a surge, while the "strength" indicates the intensity of this surge in frequency. The higher the intensity, the greater the influence of the keyword in the corresponding time zone of the research field. The lower the intensity, the more advanced the keyword. The key words that broke out before 2024 are trending topics. The most recent

burst keywords were "Impact" (2019-2024), "Game" (2020-2024), "Meta-analysis" (2021-2022) and "EFL" (2022-2024).

Discussion

This study presents a bibliometric analysis of research on SLVA from January, 2000 to April, 2024, aiming to systematically summarize key trends in the field. Most of the papers analysed were journal articles, primarily consisting of original research. The analysis covers five dimensions: annual publication trends, geographical distribution, institutional contributions, leading authors, and key research themes. The goal is to help scholars gain a clearer understanding of the research landscape and evolving trends in vocabulary acquisition strategies, ultimately contributing to the practical application of these findings in English language teaching. To the best of our knowledge, this is the first study to explore SLVA trends using a bibliometric analysis of publications from 2000 to 2024. It provides valuable insights into publishing patterns and emerging topics, offering guidance for future research and applications in the field.
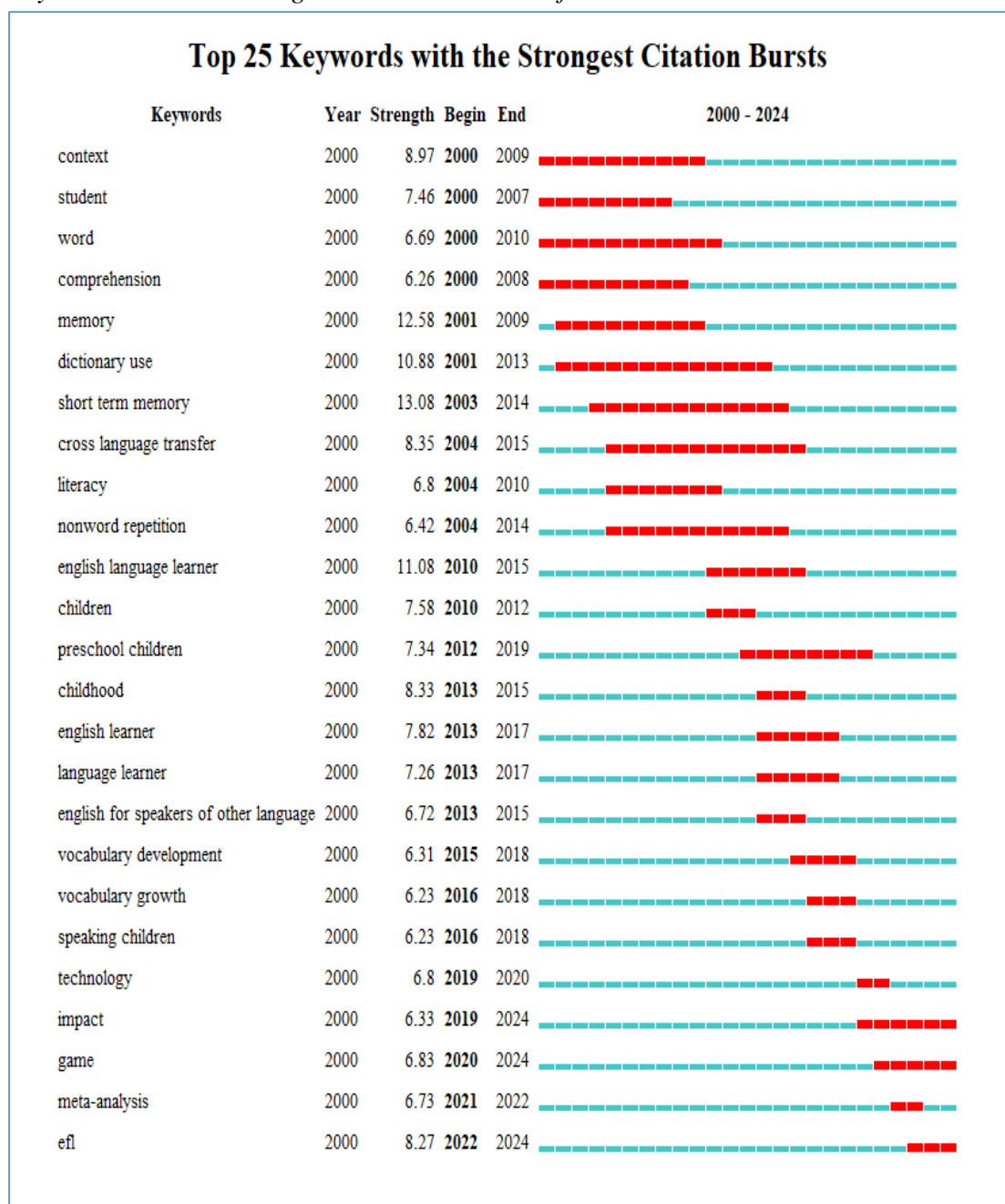
This study examined a total of 3,905 publications across various types of documents. Analysing annual publication trends reveals a slow increase in SLVA research from 2000 to 2018, followed by a rapid growth in publications from 2018 to 2024, reflecting a rising interest in the field. By analysing citation data and keywords from WoS, the study conducted three types of bibliometric analysis to pinpoint influential academic papers, key authors, leading research institutions, geographical regions, and prominent research topics in the SLVA field over the past 24 years. The scientific network diagrams and keyword analysis highlight major shifts and emerging trends in the field.

In this bibliometric analysis of publications on SLVA, the United States (1,079 publications) and Radboud University Nijmegen (55 publications) emerged as the most fruitful country and research institution, respectively. Among the top 10 fruitful countries, nine were developed nations, with China being the only developing country represented, highlighting China's significant contributions to research in this field. All of the top 10 institutions were universities, emphasizing the role of these academic institutions as the primary research hubs. This finding underscores the leadership of U.S. academic institutions in SLVA research, positioning the United States as the dominant force in this area of research.

In this study, we recognized several prominent authors who have made important contributions to research in SLVA. Author information is valuable for building potential collaborations and networks (Zheng & Wang, 2019). For instance, Stuart Webb, the most prolific author in the field with 29 papers, is affiliated with the University of Western Ontario in Canada. His research primarily focuses on vocabulary learning and language development (Kim & Webb, 2023; Webb et al., 2023). A meta-analysis was conducted to investigate the impact of exposure to L2 meaning-focused input on incidental vocabulary acquisition, discovering that learners' incidental vocabulary improvements were comparable across reading, listening, and speaking (Webb et al., 2023). In another highly cited article, he demonstrated the effectiveness of English as a Foreign Language (EFL) programs on vocabulary development (Webb & Chang, 2012).

Figure 3

Keywords with the Strongest Occurrence Burst from 2000 to 2024

Top 25 Keywords with the Strongest Citation Bursts

Keywords	Year	Strength	Begin	End	2000 - 2024
context	2000	8.97	2000	2009	
student	2000	7.46	2000	2007	
word	2000	6.69	2000	2010	
comprehension	2000	6.26	2000	2008	
memory	2000	12.58	2001	2009	
dictionary use	2000	10.88	2001	2013	
short term memory	2000	13.08	2003	2014	
cross language transfer	2000	8.35	2004	2015	
literacy	2000	6.8	2004	2010	
nonword repetition	2000	6.42	2004	2014	
english language learner	2000	11.08	2010	2015	
children	2000	7.58	2010	2012	
preschool children	2000	7.34	2012	2019	
childhood	2000	8.33	2013	2015	
english learner	2000	7.82	2013	2017	
language learner	2000	7.26	2013	2017	
english for speakers of other language	2000	6.72	2013	2015	
vocabulary development	2000	6.31	2015	2018	
vocabulary growth	2000	6.23	2016	2018	
speaking children	2000	6.23	2016	2018	
technology	2000	6.8	2019	2020	
impact	2000	6.33	2019	2024	
game	2000	6.83	2020	2024	
meta-analysis	2000	6.73	2021	2022	
efl	2000	8.27	2022	2024	

In addition to the two keywords "vocabulary" and "acquisition" which are directly related to the topic of this study, the word "vocabulary acquisition" is also a burst word in recent years, which shows that researchers can pay close attention to this topic directly and highlight it as one of the keywords. The keywords that appear most frequently are "children" and "English", Childhood is the key period of language acquisition. Many articles have carried out in-depth research on the relevant content of individual vocabulary acquisition in childhood. Kathryn A et al. reviewed the link between parents' income and children's language development with low-income families as the research object (Leech et al., 2013). Marston, L. investigated the related factors of vocabulary acquisition at the age of 2 for children born at 28 weeks or less in

2007, and concluded that clinical factors, especially indicators of severe incidence rate, dominated the related factors of vocabulary acquisition at the age of 2 for preterm children (Marston et al., 2007). Although there are many articles on the advantages of reading storybooks for monolingual children, there are few studies on the benefits of reading storybooks for English second language learners. Collins focused on the current knowledge gap in acquiring English vocabulary through reading storybooks, and found that rich explanations, initial English acceptance level, initial English expression level and the frequency of reading at home have significant independent effects on the acquisition of target vocabulary (Collins, 2005).

Burst keywords are typically regarded as indicators of cutting-edge topics or emerging trends. In this study, the most recent burst keywords included *"Impact", "Game", "Learner", "EFL", "Technology"* and *"Reading Comprehension"*. Many articles have explored the impact of different factors on second language acquisition (Jahrani & Listia, 2023; Melani et al., 2024), such as the impact of exposure (Jahrani & Listia, 2023; Muñoz & Cadierno, 2021), input (Verhelst et al., 2012) on second language acquisition. Integrating valuable games into English classroom setting could bring a lot of benefits, thus, researchers have investigated the potentials of serious games for language acquisition (Hung & Yeh, 2023; Kazu & Kuvvetli, 2023). Learner-related factors are also important sources in vocabulary acquisition. Among the different factors affecting learners' learning effect, the emotional factors such as attitude, orientation, motivation and anxiety are the significant and key variables. In the process of vocabulary acquisition, individual factors play an important role. For example, emotional variables such as learner's learning attitude, personality orientation, motivation and anxiety are important and key factors (Culhane, 2004; Sadeghi, 2013). In this regard, different studies show that learners' positive attitude is an important element contributing to students' successful learning (Dörnyei, 2006). In addition, other factors have posed significant challenges for most learners, such as the lack of an immediate environment, the reliance on academic settings for vocabulary learning, and the vast amount of vocabulary to be learned (Nation & Waring, 1997).

Among various variables, gender is a significant one that strongly affects second language learning, influencing study methods and the selection or use of language learning strategies (Oxford, 1990). Many individuals are introduced to an L2 after they have attained native proficiency in their L1, especially taking EFL. Many articles delved into the intricate vocabulary acquisition process among L2 students since vocabulary learning remains one of the biggest barriers for EFL learners, exploring their challenges and strategies to enhance their lexical knowledge.

In recent years, the word technology has been attached importance in SLVA related research. A study applied the virtual reality method based on experiential learning to a college geography English course, and proved that the learning-based virtual reality method is of great value in incidental vocabulary acquisition, cognition, behaviour and social participation (Li et al., 2022). In order to explore whether the physical reading context has an effect on incidental vocabulary learning, a moderate correlation between incidental vocabulary acquisition, reading context and L2 vocabulary size was found (Reynolds, 2022). Finally, various studies have found that vocabulary can be learned by product through activities such as reading (Bisson et al., 2014; Elgort et al., 2015; Elgort & Warren, 2014; Pellicer-Sánchez, 2015). Learners' vocabulary size can help them attain better reading comprehension (Roth et al., 2010; Wagner

et al., 2007). Lee et al. compared electronic and paper text annotations to measure the instructional impact of Computer-Assisted Language Learning (CALL) in terms of vocabulary acquisition and reading comprehension (Lee et al., 2015).

To sum up, the bibliometric analysis reveals several key themes in SLVA research, highlighting notable trends and disparities with implications for diverse stakeholders. The dominance of the United States, producing the highest number of publications, reflects its robust academic infrastructure, substantial research funding, and global influence of English. However, the limited representation of developing countries, apart from China, can reflect significant inequities in research opportunities and knowledge dissemination. Similarly, while universities dominate as research hubs, the lack of contributions from non-academic sectors suggests untapped potential for interdisciplinary collaborations. Emerging keywords like "technology," "games," and "EFL" signal a shift towards innovative, learner-centred approaches, driven by advancements in digital tools and global demand for English language skills. This evolution indicates a growing need to explore the practical integration of these strategies into teaching, especially in under-resourced contexts. Additionally, the focus on learner-related factors, such as motivation and anxiety, emphasizes the importance of personalized approaches to vocabulary acquisition. Policymakers and educators must leverage these insights to address disparities, foster international collaborations, and adopt evidence-based practices to enhance SLVA research and its application across diverse educational settings.

Conclusion

A thorough bibliometric analysis covering the period from 2000 to 2024 highlighted a notable rise in publications beginning in 2018. This trend reflects an increasing focus on SLVA, underscoring its relevance in language learning and teaching, particularly in EFL settings. Among the contributors to SLVA research, the United States stands out as the leading country, while Radboud University Nijmegen is recognized as the most prolific institution. This dominance by developed countries underscores their leadership in shaping the research landscape, although notable contributions also come from China, highlighting its growing influence in the field. Stuart Webb from the University of Western Ontario stands out as the most prolific author, contributing significantly to meta-analyses and studies on vocabulary learning and language development. His research highlights the significance of engaging with meaning-focused input in a L2 and demonstrates the impact of EFL programs on enhancing vocabulary acquisition. The analysis identified several burst keywords such as "Impact," "Game," "Learner," "EFL," "Technology," and "Reading Comprehension." These keywords indicate emerging trends and frontier topics within SLVA research, including the exploration of educational games, learner-related factors, and the integration of technology like virtual reality into language learning contexts.

This bibliometric analysis sheds light on prevailing research trends while highlighting important gaps that warrant further investigation in the field of SLVA. Although considerable progress has been achieved in understanding vocabulary acquisition in second language contexts, numerous opportunities for future research and advancement remain. Interdisciplinary collaboration emerges as a crucial recommendation, involving linguists, psychologists, educators, and technologists to enhance SLVA research by incorporating

diverse perspectives and methodologies. For example, cognitive psychology can contribute to creating effective vocabulary learning strategies, while innovations in educational technology, such as gamification and virtual reality, can offer novel approaches to vocabulary acquisition. Additionally, the study emphasizes the value of longitudinal research to observe vocabulary growth over time and across various learner demographics. Investigating how vocabulary acquisition progresses from early childhood to adulthood, along with the influence of factors such as socio-economic status and educational contexts, is identified as a key area for further exploration. Furthermore, there is a growing need for research that explores the effectiveness of vocabulary acquisition strategies in diverse linguistic and cultural contexts. Investigating how strategies tailored to specific learner populations, such as learners of English as a Second Language (ESL) versus EFL, can optimize vocabulary learning outcomes is essential for developing inclusive and effective educational practices.

The study suggests exploring the intersectionality of vocabulary acquisition with other domains such as reading comprehension and language proficiency. Research that examines how vocabulary knowledge contributes to overall language skills and academic achievement can provide actionable insights for curriculum design and educational policy. Lastly, promoting knowledge sharing and dissemination within the SLVA research community is critical. Establishing platforms for researchers to exchange findings, methodologies, and best practices can accelerate progress in the field. This collaborative approach not only enhances the rigor and applicability of SLVA research but also fosters a community-driven effort towards advancing educational practices globally.

As a metrological analysis software, CiteSpace can only be used to analyse literature including complete recorded data at present. Therefore, the data source of this study is academic journal papers, excluding conference reports, dissertations, books and other forms of research. The research method of bibliometrics will lead to insufficient coverage of the measurement system. To overcome the limitations of focusing solely on academic journal papers in bibliometric analyses, future researchers should integrate diverse data sources. This can be achieved by using multiple bibliographic databases and complementary tools like VOSviewer or Gephi, which support various document types. Researchers should also consider manually curating and pre-processing datasets or collaborating with librarians and data scientists for thorough data integration. Advocating for and contributing to enhancements in bibliometric software like CiteSpace can expand its capabilities. Combining these approaches with qualitative content analysis and interdisciplinary research will provide a more comprehensive and robust analysis.

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