

Research Status and Trends of High School English Vocabulary Teaching – A Visual Analysis Based on CiteSpace

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Abstract—This study aims to reveal the research status and development trends in this field by analyzing the publication volume and the key terms through a visual analysis based on CiteSpace of 195 journals from 2014 to 2023 on high school English vocabulary teaching in the China National Knowledge Infrastructure (CNKI) database. The research finds that the research hotspots in the past decade focused on “strategies”, “context”, “information technology”, and “new curriculum standard”. The research trend shows an initial growth followed by a decline, and especially in recent years, the research focus has gradually shifted towards high school English vocabulary teaching centered around thematic context.

Keywords—high school English, English vocabulary, English teaching, CiteSpace

I. INTRODUCTION

Vocabulary is one of the basic elements of language, encompassing all words and phrases in a language. According to The 2017 Ordinary High School English Curriculum Standard, words are the building materials of language and the smallest units that can be used independently. Any word in vocabulary establishes certain connections with other words through syntactic and semantic relationship, and conveys information in context [1]. For English learners, whether in listening comprehension, speaking, reading, or writing, a certain vocabulary base is essential. Therefore, in high school English teaching, vocabulary plays a foundational role.

The new curriculum standard emphasizes that the focus of high school vocabulary teaching is to cultivate students' chunk awareness in context and increase vocabulary through extensive reading to enhance students' ability to use vocabulary [1]. It sets the target at mastering 4000–4200 words for students, while requiring them to understand and express accurately based on word roots, affixes, and chunks in different themes and contexts. Thus, the new curriculum sets higher demands for students' English proficiency.

However, in traditional high school English vocabulary teaching, vocabulary instruction is not integrated with

context and detached from other types of classes, and the students' subjectivity is overlooked [2]. This leads to a lack of contextual support in vocabulary memorization for students and a lack of motivation in vocabulary memorization. Under the requirements of the new curriculum, teachers need to lead students to understand and use language through context, and enhance in-depth comprehension of texts through vocabulary teaching [3]. Therefore, in order to better implement vocabulary teaching methods under the new curriculum standard, teachers could rely on the research of high school vocabulary teaching conducted both before and after the release of the new curriculum standard, considering the limitedness of the published relevant papers affected by the pandemic.

Based on the CiteSpace software to conduct a visual analysis of the themes related to “high school English vocabulary” and “English teaching” from 2014 to 2023 in CNKI, this paper aims to clearly present the research hotspots and development trends in high school English vocabulary teaching over the past decade, and provides enlightenment for further exploration of high school English vocabulary teaching.

II. LITERATURE REVIEW

Before the release of The 2017 Ordinary High School English Curriculum Standard, research on high school English vocabulary teaching mainly focused on the exploration of context and teaching strategies. For example, Wang [4] suggested thoroughly understanding the textbook, implementing tiered vocabulary teaching, using direct methods, word-formation methods, and creating contexts to make vocabulary teaching meaningful; Chen [5] focused on lexical chunks to help students master vocabulary and significantly expand their vocabulary size. She thought that teachers should guide vocabulary teaching with chunks, establish awareness of chunk-based teaching, value the role of lexical chunks in English education, and adopt practical teaching methods to strengthen the input and output of chunks; Peng [6] stressed the use of English vocabulary learning strategies, which include the techniques, behaviors, or measures that students adopt to improve the learning efficiency. However, with the release of the 2017

new curriculum standard and the impact of the pandemic, the number of studies significantly decreased, focusing mainly on information technology, thematic contexts, and teaching strategies aimed at core competencies. For example, Tong [7] introduced the multimodal vocabulary learning method under the guidance of thematic significance; Su [8] thought vocabulary teaching based on core competencies should be guided by thematic significance, carried by discourse, and supported by context, allowing vocabulary learning and usage to naturally permeate the process of text interpretation; Zhang [9] pointed out that the cultivation of students' core competencies should be emphasized in vocabulary teaching. That is, through vocabulary instruction, students' language abilities should be developed, their thinking qualities should be enhanced, their cultural awareness should be cultivated, and their learning capabilities should be developed; Ma [10] stated that a corpus can display the context in which the target vocabulary is located, presenting various linguistic information about the words. Contextualized vocabulary learning is beneficial for mastering the multiple meanings of words, effectively improving students' vocabulary knowledge level, and fostering students' autonomous learning abilities. Due to the limited number and dimensions of research papers and the insufficiency of literature studies following the release of the new curriculum standard, teachers should also pay attention to the research conducted before the new curriculum standard in order to gain inspiration and enlightenment, and thus integrate these findings with the new curriculum standard for better vocabulary teaching.

III. METHODOLOGY

A. Data Source

The data for this study is from the China National Knowledge Infrastructure (CNKI). The theme entered was "English vocabulary teaching", the secondary theme selected was "high school English vocabulary teaching"; the searched years were from 2014 to 2023, and the type of literature searched was academic journals. After excluding some irrelevant literature, a total of 195 journal articles on high school English vocabulary teaching were selected and exported from CNKI in Refworks format for a visual analysis based on CiteSpace software.

B. Research Method

CiteSpace software is a tool that can visualize and analyze large amounts of literature data. Based on the analysis using CiteSpace, this study retrospectively reviews high school English vocabulary teaching research over the past decade from the perspectives of annual publication volume and key terms; the research hotspots and development trends are presented through keyword timeline and burst maps.

IV. RESULTS AND DISCUSSION

A. Analysis of Annual Publication Volume

The annual publication volume reflects the mapping of literature volume at different time points. The temporal

changes in publication volume can reflect the popularity and dynamic trends in a research field. As shown in Fig. 1, from 2014 to 2023, the research publication volume on high school English vocabulary teaching shows an overall trend of initially increasing and then decreasing, which can be roughly divided into three stages. The first stage (2014–2016): rapid development period. During this stage, the publication volume was 90 articles in total, accounting for 46.2% of that of the decade, and increased year by year, reaching a peak of 35 articles in 2016. This indicates that domestic research on high school English vocabulary teaching was in a rapid development stage during this period. The second stage (2017–2019): fluctuation period. During this stage, the publication volume was 69 articles in total, accounting for 35.3% of that of the ten years, and decreased followed by an increase. With the release of The 2017 Ordinary High School English Curriculum Standard, teachers and scholars needed time to interpret, research, and apply them, leading to a decrease in publication volume in 2017–2018 and an increase in 2018–2019. The third stage (2020–2023): bottleneck period. The publication volume during this stage was 36 articles, accounting for 18.5% of the total publication volume, and demonstrated a continued decline. During this period, due to the impact of the pandemic, teachers could only conduct teaching through online classes. However, the limitations in space and interaction in online classes brought ineffective implementation of teachers' applying and researching the vocabulary teaching requirements and strategies in actual classrooms based on The 2017 Ordinary High School English Curriculum Standard. Therefore, the publication volume continued to decrease during this stage.

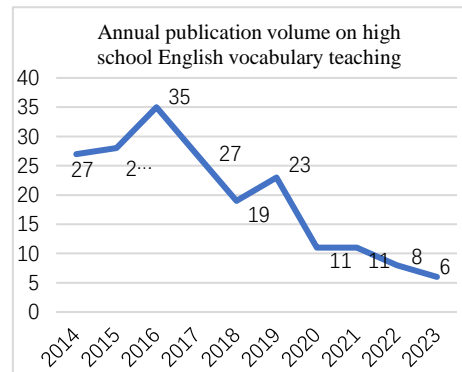


Fig. 1. Annual publication volume 2014–2023.

B. Co-occurrence Analysis of Keywords

TABLE I. TOP 10 KEYWORDS WITH CENTRALITY

Serial Number	Frequency	Centrality	Keywords
1	10	0.00	Strategy
2	7	0.00	Teaching Method
3	7	0.01	Teaching Strategy
4	6	0.00	Context
5	6	0.00	Problem
6	6	0.00	Context Theory
7	6	0.01	New Curriculum Standards
8	5	0.00	Mind Map

CiteSpace, v. 5.3.R1 (64-bit) Advanced
 July 19, 2024, 6:44:58 PM CST
 CNK1: C:\Users\SHY\Desktop\cnk1\data
 Timespan: 2014-2023 (Slice Length=1)
 Selection Criteria: g-index (k=25), LRF=3.0, LN=10, LBY=5, e=1.0
 Network: N=207, E=472 (Density=0.0221)
 Largest S CCs: 216 (105%)
 Nodes Labeled: 1.0%
 Pruning: None

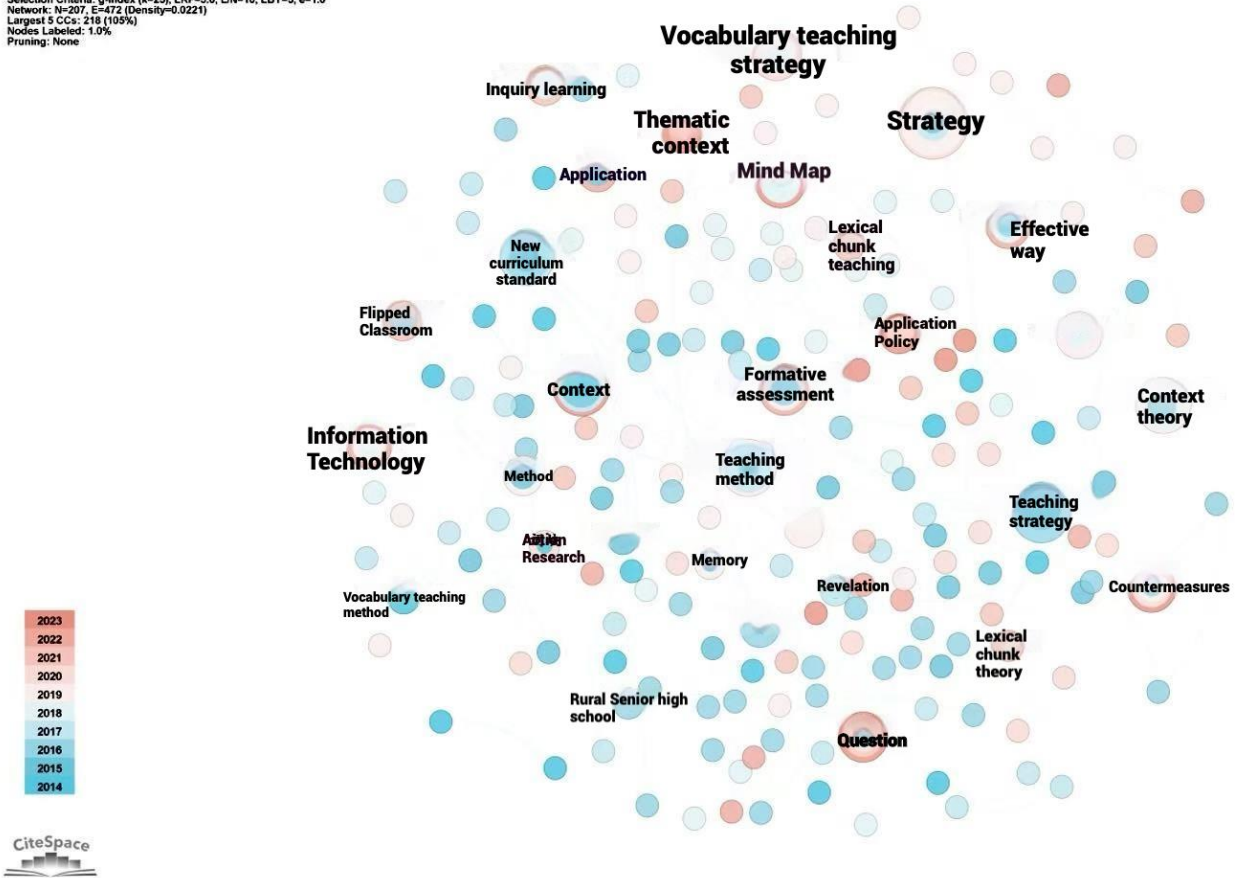


Fig. 2. Keyword co-occurrence map.

Keywords are highly summarized focuses of article content, and their appearance frequency can effectively reflect research hotspots of a field. A keyword co-occurrence map based on the CiteSpace can present clearly the research hotspots. In Table I, the top 10 keywords with their centrality are presented, after excluding the keywords repeated in the article titles.

Through analysis of the left keywords, which are extracted from the 195 articles but unduplicated in the article titles, a keyword co-occurrence map is produced based on CiteSpace, as shown in Fig. 2, N represents nodes, and E represents edges, with $N = 207$ and $E = 472$. In the map, the size of nodes reflects the frequency of appearance of keywords, with larger circles indicating higher frequency. From Fig. 2, it is evident that keywords such as “strategies”, “teaching methods”, “context”, “new curriculum standard”, and “issues” have larger circles, indicating higher prominence and stronger centrality.

C. Keyword Cluster Analysis

The keyword cluster map reflects different research focal points in the field. Building upon the keyword co-occurrence map, using the LLR algorithm with k set to be 7, a keyword cluster map is generated (as shown below in Fig. 3). The Modularity Q value is 0.5392 (Q value greater than 0.3 indicates clear clustering effect), and Silhouette value is 0.9159 (S value greater than 0.5 indicates very

high credibility). The map shows 7 clusters in different colors, namely “context”, “new curriculum standard”, “teaching strategies”, “chunk theory”, “information technology”, “strategy training”, and “classification method”. Each cluster’s label is a keyword from the co-occurring network, with lower cluster numbers indicating more keywords included and higher numbers indicating fewer keywords, as detailed in Table II.

TABLE II. CLUSTER DETAILS

Serial Number	Number	Year	Keywords included
0	72	2017	Context, Thematic Context, Mode
1	30	2016	New Curriculum Standards, Teaching Strategies, Memory
2	27	2015	Teaching Strategies, Flipped Classroom, Context
3	18	2019	Lexical Chunk Theory, Memory Rules, Application Strategies
4	12	2017	Information Technology; Words are not taught in isolation; Teaching Strategies
5	7	2019	Strategy Training; Consolidation; Application
6	7	2015	Classification Method; Word - formation Method; Combing and Induction

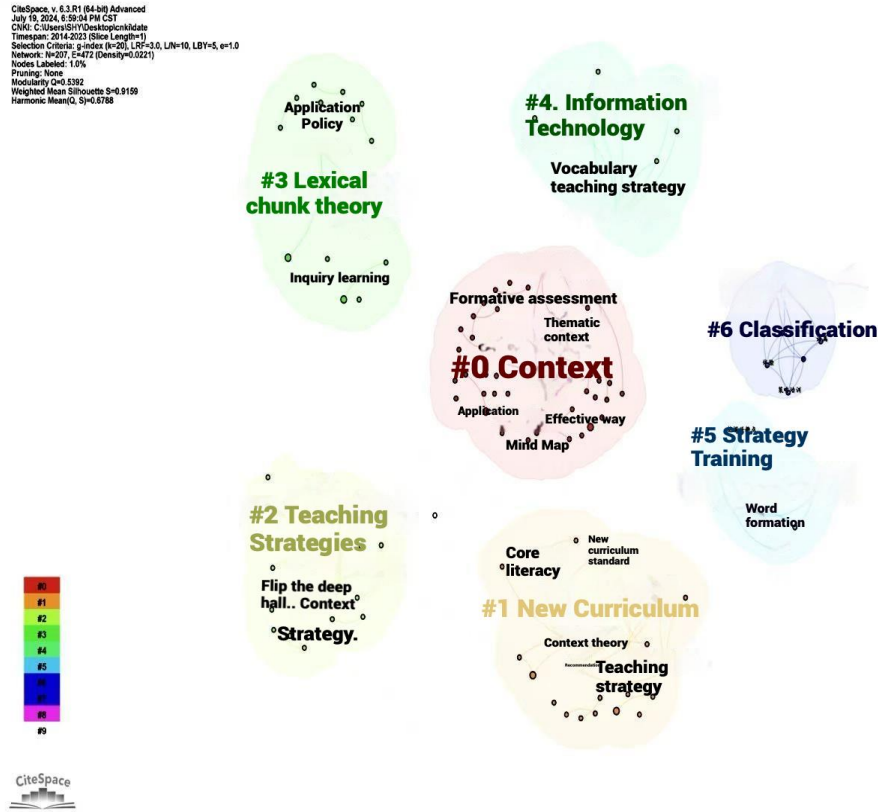


Fig. 3. Keyword cluster map.

Based on the systematic analysis of keyword co-occurrence and cluster maps discussed above, seven core aspects can be concluded on high school English vocabulary teaching in the past decade in China. Due to overlapping of some concepts from these aspects, organization and summary of the articles are conducted and three main research hotspot themes have been identified as follows.

Firstly, focus on teaching strategies for high school English vocabulary. This includes strategies involving context, discourse, mind maps, memory patterns, chunk teaching, word formation methods, and student learning methods. For example, Wang [11] proposed teaching strategies for high school English vocabulary under the new curriculum perspective, advocating for creating situational contexts to make vocabulary teaching meaningful and communicative, highlighting the cultivation of students' autonomous learning capabilities by emphasizing the guidance of vocabulary learning strategies. Liu [12] emphasized that vocabulary teaching must break out of the boxes and make vocabulary "come alive" in contexts and texts. Teachers should carefully design output exercises to enable students to "use" vocabulary, such as through writing exercises, a critical form of language output. Liu [13] believes that chunk teaching can help students master a larger vocabulary and exercise their ability to apply vocabulary in context. In daily reading instruction, teachers can lead students in analyzing and extracting chunks and training vocabulary extraction strategies to improve vocabulary accumulation awareness. They can also guide students in writing by

recalling and applying chunks through thinking and reflection. Zhao [14] suggests that using mind maps can strengthen the efficacy of chunk learning, improving chunk accumulation levels by enhancing the extension function of English vocabulary, and enhancing students' retention of chunks to some extent by helping students induce and summarize same-function chunk usages.

Secondly, research on vocabulary teaching based on The 2017 Ordinary High School English Curriculum Standard. This involves core literacy, thematic contexts, and discourse teaching concepts. The new curriculum [1] proposes an English learning activity model consisting of six elements: thematic context, discourse type, language knowledge, cultural knowledge, language skills, and learning strategies, aiming to cultivate students' core literacy and achieve the educational value of English as a school subject. Surrounding the new curriculum, Chen [15] points out that vocabulary teaching based on core literacy in English learning should serve thematic contexts and discourse understanding, selecting vocabulary and designing activities based on contextual tasks to seamlessly integrate vocabulary learning into information processing activities. Ni [16] suggests that teachers can, based on thematic contexts, through the use of mind maps, expand and supplement vocabulary or conduct vocabulary skill teaching to change students' vocabulary memorization and learning methods, thus improving English vocabulary efficiency.

Thirdly, integration of information technology and high school English vocabulary teaching. Wang [17] suggests that teachers can use online corpora to enrich students'

vocabulary knowledge and enhance their ability to use language in context. Information in corpora comes from the real language usage of native English speakers, providing authentic contexts for students to learn, mimic, and apply vocabulary in real language contexts. Dai [18] proposes vocabulary teaching under the micro-lesson model. Micro-lessons, products of the information age, based on micro-videos, present English knowledge to students by combining audio and video. Teachers can utilize micro-lessons to create mind maps to reinforce vocabulary memory and inspire student self-directed learning. Li [19] analyzes the integration of information technology and vocabulary teaching as continually evolving but not achieving ideal results. He presents three paths for the integration: effective selection of teaching materials, optimization of classroom teaching designs, and strengthening post-class teaching practices.

The detailed explanations above illustrate the research hotspot themes in Chinese high school English vocabulary teaching over the past decade, providing a macroscopic presentation of the research topics and directions of high school English vocabulary teaching in China. In the following text with the help of keyword emergence graphs and timelines, the research priorities at each stage, the changes in hot topics between stages, and future research directions will be detailed.

D. Keyword Emergence Graph and Keyword Timeline View

Fig. 5 shows a total of 7 clusters, with each cluster's label representing co-occurring keywords that appeared in the corresponding years. This clearly displays the development and trends of each cluster's keywords within the specified years. From Fig. 1, it is known that the overall development trend of high school English vocabulary teaching research in China over the past decade has been an initial rise followed by a decline. The development period can be divided into the following three stages:

The first stage is the Rapid Development Period (2014–2016). Combining Figs. 4 and 5, “context” and “teaching strategies” are the main research hotspots of this stage. At the same time, Fig. 4 shows that “the new curriculum standard” has the longest duration, covering the entire rapid development period. Here, the new curriculum standard refers to the “The Ordinary High School English Curriculum Standard (Experimental)” promulgated by the Ministry of Education in 2003. Therefore, based on the above analysis, the research during this stage focuses on the study of high school English vocabulary in the context of the new curriculum standard and teaching strategies. Xie [20] proposes planned vocabulary teaching, such as classifying vocabulary and choosing different strategies in vocabulary teaching. He believes that context can be provided to highlight word meaning and collocation. Qiu [21] believes it is necessary to reasonably choose primary and secondary words to ensure orderly teaching, and also to use teaching situations to implement vocabulary teaching methods through various channels. She also emphasizes the context teaching method, understanding

new words by integrating vocabulary into sentences or language paragraphs, and also creating certain language situations from real life to help students understand correctly.

The second stage is the Fluctuation Period (2017–2019). Combining Figs. 4 and 5, “information technology” and “core literacy” emerged in 2018 and are the main research hotspots of this stage. The Ordinary High School English Curriculum Standards (2017 Edition) proposed the core literacy of high school English as a subject, and a large number of scholars have interpreted and studied it. At the same time, with the development and popularization of information technology, teachers and scholars consider combining information technology with classroom vocabulary teaching to achieve better results. Fig. 4 shows that the research content will evolve towards “strategies” in high school English vocabulary teaching. Chen [22] emphasizes, based on the new curriculum standard, that all language learning activities should be carried out under certain thematic contexts, and teachers should implement the principle of learning by using and using by learning in vocabulary teaching. Zhao [23] proposes that high school English vocabulary teaching research can be conducted based on corpora. A corpus is a large amount of oral or written material stored electronically under certain principles. In actual teaching, teachers can decide whether to use a corpus for vocabulary teaching based on factors such as vocabulary characteristics and difficulty.

The third stage is the Bottleneck Period (2020–2023). Combining Figs. 4 and 5, the research focuses on “thematic context” and “application strategies”. Analysis shows that the research during this stage focuses on high school English vocabulary teaching strategies around thematic contexts under the new curriculum standards. At the same time, these focus points, as emerging and sustained research hotspots, can represent future research trends. Zong [3], under the guidance of the new curriculum standards, emphasizes learning and practicing vocabulary without detaching from the thematic context of the discourse to enhance deep understanding of the text. The specific steps include reading the text discourse, determining class objectives, and designing and implementing teaching activities.

Top 15 Keywords with the Strongest Citation Bursts

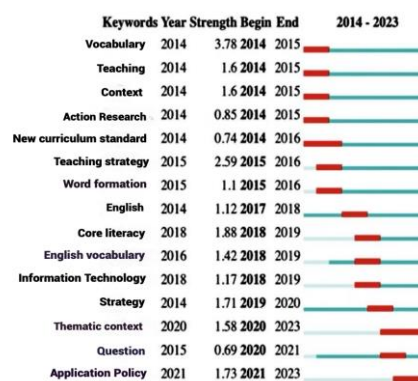


Fig. 4. Keyword emergence graph.

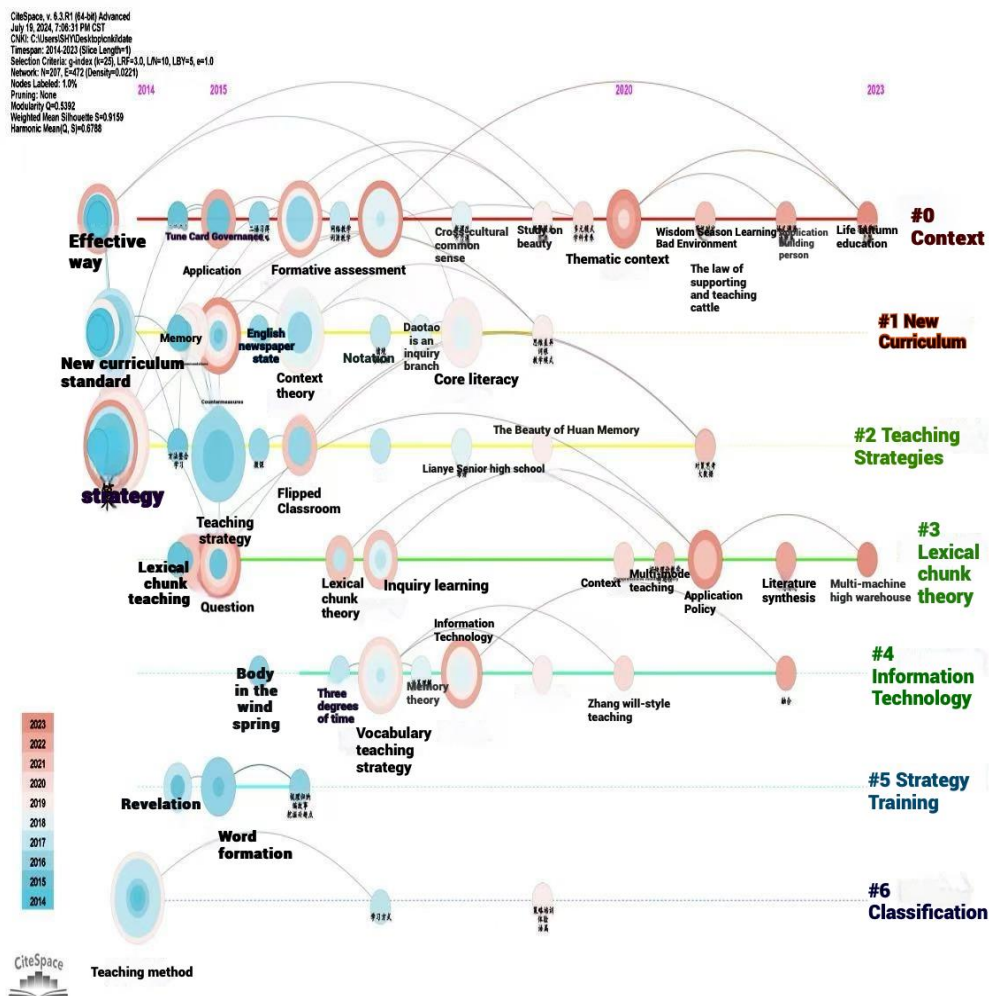


Fig. 5. Keyword timeline view.

From 2014 to 2016, teachers and scholars focused on the study of high school English vocabulary teaching strategies, such as how to create contexts for teaching, which became the hotspot of this stage. From 2017 to 2019, during this stage, with the issuance of the 2017 edition of the high school English curriculum standard, “core literacy” became the focus of scholars. At the same time, with technological development, scholars also emphasized the application of information technology. Therefore, how to cultivate core literacy in high school English vocabulary teaching and how to combine information technology for vocabulary teaching became the research focus of this stage. By 2020–2023, although affected by the epidemic, the number of publications decreased significantly, but based on the research of vocabulary teaching and the interpretation of the 2017 edition of the new curriculum standard, the research hotspot of this stage was high school English vocabulary teaching research around thematic contexts. Of course, other teaching strategies are also being studied. In summary, the research on high school English vocabulary teaching generally shows a trend of rising first and then declining, with thematic context as an emerging research hotspot, which is the future research trend in this field.

V. CONCLUSION

The results above indicate the research hotspots are focused on “strategies”, “context”, “information technology”, and “the new curriculum standard”. The research trend shows an initial increase followed by a decline, evolving and developing towards high school English vocabulary teaching research centered around thematic contexts. Though contextual vocabulary teaching under the new curriculum is so important, we shouldn’t put it as the target or center of one class, there are other significant things to be considered.

Firstly, enrich research on high school English vocabulary teaching that starts with the cultivation of students’ core literacy. Existing literature shows that teachers and scholars rarely start from the cultivation of students’ core literacy to elaborate on the concepts and principles of high school English vocabulary teaching, and to design the steps and strategies of vocabulary teaching. Secondly, expand research on the integration of high school English vocabulary teaching with information technology under the new curriculum standards. The application of information technology in teaching can provide more efficient vocabulary learning tools and resources, helping students quickly look up, remember, and review vocabulary, but the current literature rarely

involves the combination of high school English vocabulary teaching with artificial intelligence. Therefore, future research can consider the above factors for more in-depth exploration.

CONFLICT OF INTEREST

The author declares no conflict of interest.

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