Review Article

A Review and Prospect of Research on English Vocabulary Teaching in China-Based on Statistical Analysis of Three Categories of High-Quality Journals Over 31 Years

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Abstract - The study is based on the statistical analysis of research articles on English vocabulary teaching in three high-quality journal categories that include Chinese core journals, CSSCI, and CSCD from 1992 to 2023. The research tools include Citespace 6.2. R2 and visual analysis function provided by CNKI. The overall situation and trends of this field are presented by analyzing the number of publications, journal authors, research institutions, keywords, and research methods. The results show that: 1. Domestic research on English vocabulary teaching can be roughly divided into three stages: a slow-growth stage, a rapid-growth stage, and a steady-growth stage. 2. There exists cooperation among the main authors, but the cooperation among most authors is not close enough. 3. Higher education institutions are the main force in the research, especially non-foreign language colleges and universities, with a small number of secondary schools participating. 4. "English vocabulary learning strategies" is a core research hotspot. 5. It is a major trend to integrate modern information-based technologies(like corpora) with foreign language vocabulary in the future.

Keywords - Citespace, CNKI, English vocabularies, Teaching, Visualization analysis.

1. Introduction

Language and thought have an identity specifically demonstrated by the close correlation, or even unity, between language and concepts. (Feng Yan, Liu Hong, 2014) Vocabulary is one of the fundamental components of language, and it is essential to choose appropriate words whenever people want to express themselves through language in any form of communication. (Du Xuemei, 2016) In terms of foreign language learning, vocabulary acquisition undoubtedly becomes more and more crucial. The "National Curriculum for General Senior High School English (2017 version)" (it is hereinafter referred to as the "curriculum standard") categorizes it as one of the six elements of language knowledge in the English curriculum, namely: vocabulary belongs to linguistic knowledge. It, also known as lexis, is the sum of all words and phrases in a language and the construction material of language. (Ministry of Education, 2020) The teaching of English vocabulary has always been a concern in the field of foreign language education and one of the difficulties in foreign language learning. Whether it concerns reading (such as Ma Yawei, 2019, Ma Ning, 2015), listening (such as Du Fangyuan, 2015, Wang Hong, 2015), writing (such as Xu Guoqin, 2017, Li Tingwen, 2013) or other areas, the lack of vocabulary makes it difficult for English learners to achieve their language learning goals. Therefore, the importance of vocabulary in English learning is self-evident. At the same time, how to efficiently and effectively master English vocabulary to save time and effort has become a pressing problem that needs to be solved. In view of this, this article intends to figure out the current situation and hotspots of English vocabulary teaching by analyzing related domestic literature.

2. Research Design
2.1. Research Questions

Based on the research literature on English vocabulary teaching in China over the past 31 years, this article focuses on several questions: Firstly, what is the overall situation of English vocabulary teaching research in China? Secondly, what are the hotspots in researching English vocabulary teaching in China? Thirdly, what is the trend of research on English vocabulary teaching in China? Fourthly, what research methods are used in English vocabulary teaching in China?

2.2. Research Tools and Methods

This article will mainly use Citespace, a software developed by Dr. Chen Meichao, as the main analysis tool. This software can draw a scientific knowledge map of a research field and visually present the research topic's hotspots, evolution, and cutting-edge trends. (Chen Chaomei, 2006) At the same time, reading the specific contents of related literature will be conducted for further analysis and summary to ensure the validity and credibility of the research results as much as possible.

The bibliometric analysis method mainly conducts statistical research on related literature and visually displays the main research hotspots and evolutionary trends through the knowledge map of the content studied. The content analysis method is to elucidate the research object's essence, characteristics, and development frontier by analyzing its explicit and implicit information. (Yu Ling, He Ningxing, Li Daoxue, 2023)

2.3. Data Source and Processing

The data used in this study are all from the CNKI. In the advanced search, "English vocabulary+teaching" is used as the subject keyword, and the time period is from 1992 to 2023. The source of journal types is limited to the three categories: Chinese Core Journals, CSSCI and CSCD, to ensure the data analysis quality. Then, 552 journals were obtained, and after manually filtering out conference papers, book reviews, interviews, and literature with low relevance, 427 effective articles were finally selected as the research object. They are stored in TXT format in refworks form from the CNKI, renamed as "download_01" for easy identification by the CiteSpace, and used as the basic research data of this article. At the same time, for the sake of later convenient operation, five folders named CNKI, data, input, output, and project are respectively established, and the latter four folders are placed in the CNKI folder in turn.

3. Research Results

3.1. Analysis of the Annual Publication Output

The temporal distribution of literature in a certain field reflects, to some extent, the development speed and progress of academic research in that field (Yang Xinyu, 2020). This article uses CNKI's built-in literature visualization analysis function to analyze 427 selected articles from those high-quality journals. The results are shown in Figure 1.
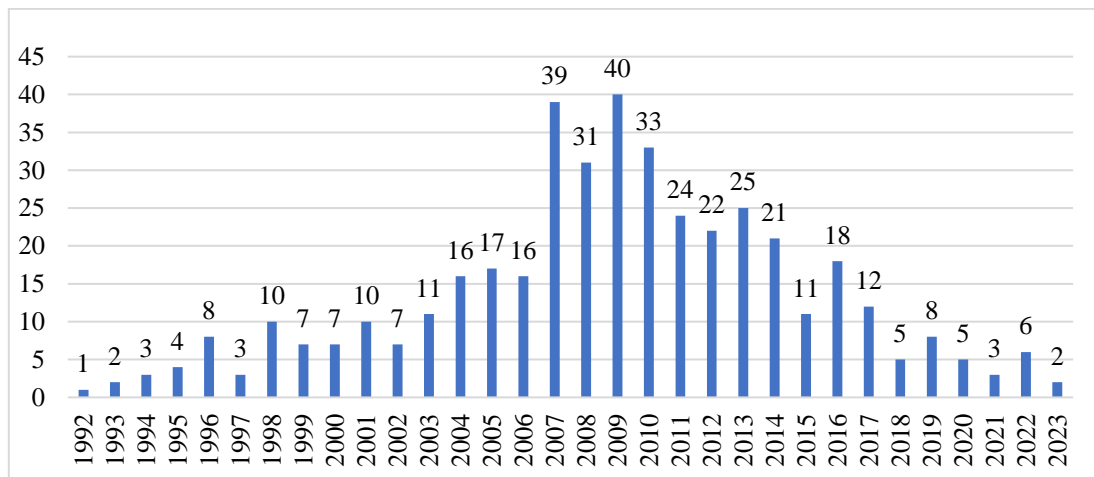

Fig. 1 The annual publication output from 1992 to 2023

From Figure 1, it can be seen that overall, the publication output of research on English vocabulary teaching has shown a trend of first increasing and then decreasing, which roughly is divided into three stages: a slow-growth period (1992-2003), a rapid-growth period (2003-2009), and a gradual-growth period (2009-2023). The peak appears around 2009, with about 40 papers, accounting for 9.3% of the total. The lowest value is about 1, appearing around 1992, accounting for 0.25% of the total. The average annual publication in this research field is 14 papers, and although the growth rate has slowed down in the past 12 years (2011-2023), it still maintains more than two papers per year. In addition, the author searches again with "English vocabulary" as the main subject term and finds that research on English vocabulary focuses more on specialized disciplines. Considering that, it can be seen that domestic scholars are still paying attention to this field, but the slowdown in growth may be due to the sub-diversification of the research discipline. The author believes that with China gradually opening up to the outside world and integrating with the international community, the research momentum on English vocabulary teaching is still strong.

3.2. Journal Author Analysis

When running the Citespace, the time span is set from 1992 to 2023 with a year per slice. The node type selected is "Author", and the author collaboration network graph is generated by clicking the "GO" button. In the graph, the size of each node represents the number of papers published by that author in the field. The larger the node, the more papers are published by that author. Connections between nodes represent collaboration among authors. The author collaboration analysis graph has 419 nodes (N value) and 116 connections (E value), with a density of 0.0013, which is relatively low (D value).

According to Figure 2, the most prolific authors are respectively Zhang Ping, Yu Jun, Ge Xuhua, Huang Yueping, Yang Qin, Lu Zhi, Zhang Min, Lin Jing, Li Chuanfang, Zhu Ping, Zhang Weiyu, Yu Yang, Zhang Shufang, Zhang Hong, Zeng Yuhong, as well as Ma Yumei, accounting for 3.8% of the total. Most of the authors have only written one article that is published in the core journal. It indicates that there are relatively few high-quality journals with prolific authors in the field of English vocabulary teaching research. At the same time, according

to the author's cooperation graph, there are only three groups of major authors: Zhang Hong-Ge Xuhua, Yu Yang-Zeng Yuhong, and Li Chuanfang-Yu Jun-Lin Jing. The majority of the remaining authors work individually, and most collaborations are conducted between two authors, with certain three or four-party collaborations occasionally.

However, the vast majority are isolated and relatively scattered. Therefore, although prolific authors collaborate to explore vocabulary teaching and play a leading role actively, most authors do not cooperate with others closely, resulting in a sparse graph.
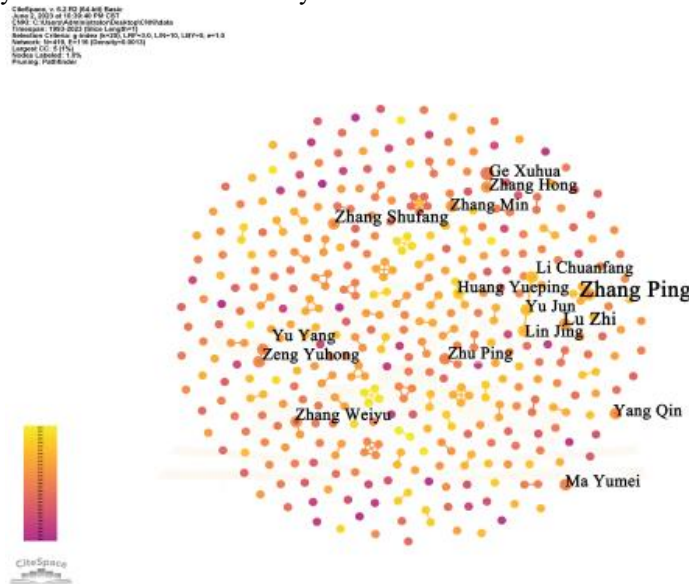

Fig. 2 Author collaboration network graph

3.3. Analysis of Research Institutions

The layout of the main research forces can be clarified by analyzing and sorting research institutions, which, in return, can provide certain guidelines for future cooperation among scientific research institutions. (Pei Xishan, 2021) The analysis steps between Research Institutions, and Author Analysis are roughly the same (time span, slicing, etc.). We just need to set the node type as an institution and then click "Go". Then the required institution collaboration network graph can be generated-Figure 3: N value is 373, E value is 56 and D value is 0.0008, which is at a low level. The size of the nodes in the figure represents the publication frequency of the institutions. Moreover, the connection between the nodes proves the existence of cooperation.

According to Figure 3, only two key foreign language universities (Guangdong University of Foreign Studies; Beijing Foreign Studies University) are among the top ten institutions in terms of volume, while the others are non-foreign language universities. In addition, it can be seen that major universities are the main force in English vocabulary teaching research. Only a few secondary schools participate, such as Linxia River Middle School in Gansu Province, No. 41 Middle School in Guangzhou, National Middle School in Shangqiu, and Baita Senior Middle School in Lianyungang. In terms of cooperation, the top ten universities are distributed relatively sparsely and have almost no connections with one another.

Major universities lack close cooperation, with only a few scattered cooperative networks. For example: Tianjin University of Commerce-Guangdong University of Foreign Studies-Peking University (Craduate School of Education),

Shandong University (School of Foreign Languages and Literature)-Shandong University of Finance and Economics (School of Foreign Languages)-Taishan University (Department of Foreign Languages), Sichuan University Jinjiang College (Department of Foreign Languages)-Sichuan University (School of Literature and Journalism)-Chengdu College of University of Electronic Science and Technology of China; South China Normal University (School of Foreign Studies)-South China University of Technology (School of Foreign Languages) - The Affiliated High School of South China Normal University, etc.

Overall, the cooperation relationship between major universities is not close enough, with most collaboration being within institutions of the same level and area. Further efforts are needed to strengthen the cooperation between organizations of different levels and regions.

3.4. Research Hotspots and Trends

In other words, "research hotspots" refers to the topics or issues that receive great attention from the academic community in a specific field of study. Analyzing these hotspots is conducive to capturing the latest academic trends in the field. On the other hand, "keywords" are concise expressions of the core content in literature. The co-occurrence network formed by these keywords can reflect the research hotspots in a certain field of study.(Chen Yue, Chen Chaomei & Hu Zhigang, 2014)

For the node type in this analysis, we chose "keywords". The time slice and span are the same as before. After clicking "Go", we obtain Figure 4 (with N equal to 500, E equal to 966, and D equal to 0.0077). In this figure,

circular nodes represent the frequency of keywords, with node size proportional to frequency. The links between nodes represent co-occurrence relationships, with line thickness indicating strength. As time goes on, the relationship lines within the keyword co-occurrence graph change from deep purple to orange-yellow. To ensure the reliability of the analysis results, the author combines the frequency and centrality values of the keywords. These two factors reflect the hotspots of this research field to some extent. Generally, if the frequency is high and the centrality value is more than or equal to 0.1, it can be considered that the topic is highly popular.

As shown in Figure 4 and Table 1, the research hotspots include vocabulary teaching, vocabulary, English vocabulary, word formation, learning strategies and antonyms. Although topics like college English and vocabulary learning have high frequencies, their centrality values are too low.

A core research hotspot in this field can be identified by integrating the relevant keywords mentioned above and combining them with Figure 5 extracted from the subject words through the basic data (427 articles). As shown in Figure 5, it is evident that "English vocabulary learning strategies" is a core research hotspot in this field. Undoubtedly, the mastery of learning strategies affects the volume of vocabulary. Generally speaking, these two aspects are positively correlated. Domestic scholars have conducted relevant empirical research on this topic, and the research results have all demonstrated their relationship. (Chen Shaoying, 2019, Chadha, Liu Dianzhi, 2016, Zou Hong, 2011)
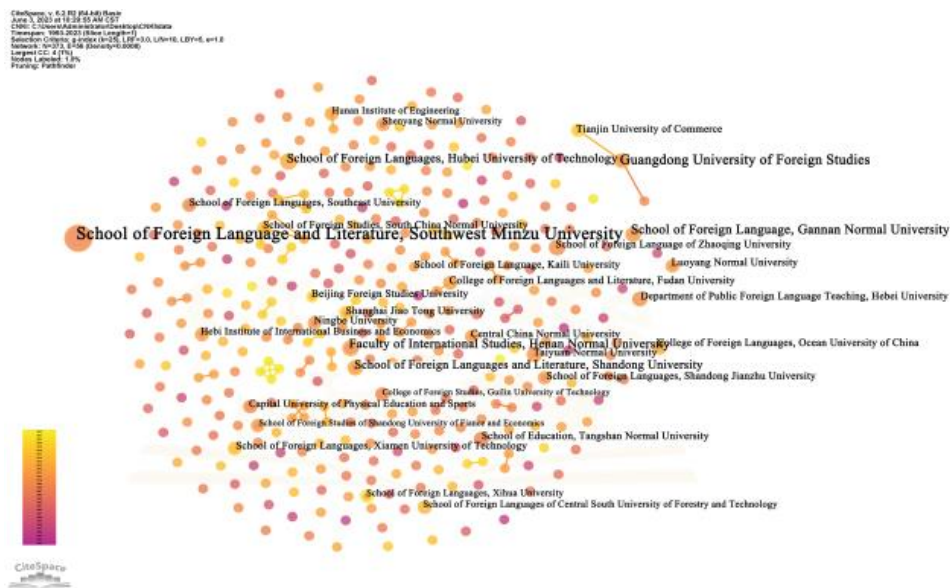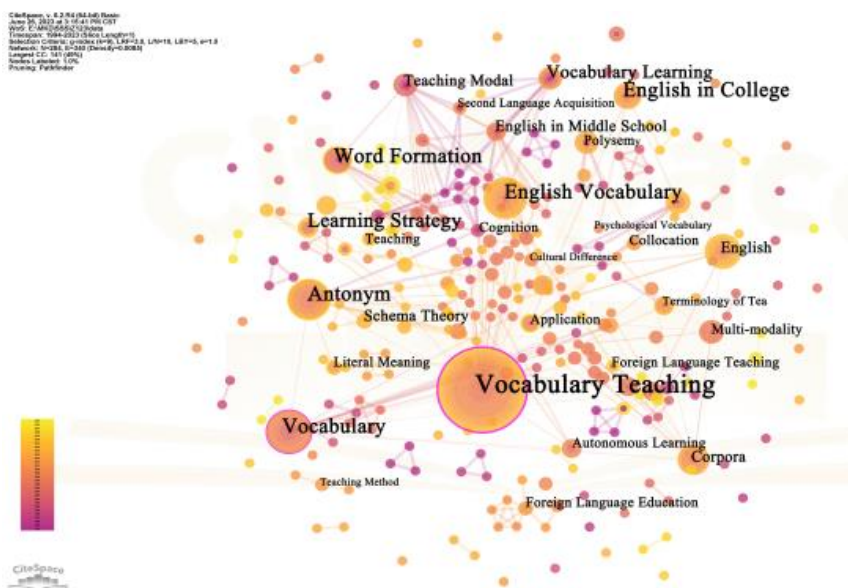

Fig. 3 Cooperation structure diagram

Fig. 4 Co-occurrence graph of keywords

Table 1. Keyword frequency and centrality value

Order	Frequency	Centrality	Year	Keyword
1	110	0.51	1999	Vocabulary teaching
2	31	0.34	1998	vocabulary
3	13	0.14	2007	Learning strategies
4	8	0.13	1994	Antonym
5	21	0.12	2001	English vocabulary
6	14	0.10	1994	Morphology
7	27	0.08	1998	College English
8	10	0.08	1998	Middle School English
9	12	0.06	1999	Corpora
10	16	0.20	1993	Word-formation
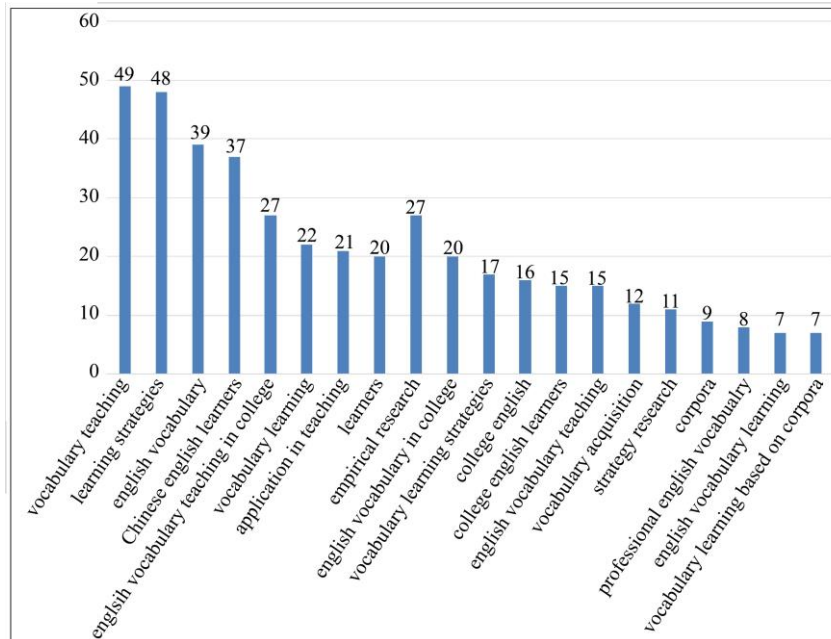
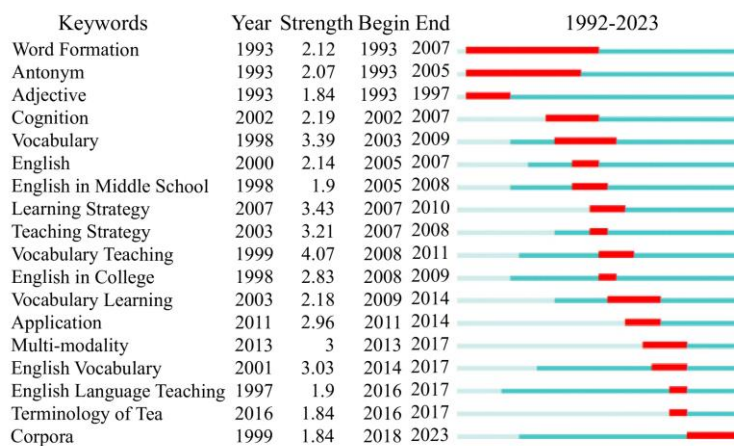**Fig 5. The main theme distribution graph**

Fig. 5 Keyword burst graph of english vocabulary

The term "burst keywords" refers to those keywords with a significant change in frequency in a short period of time. (Cheng Jun 2023) Conducting further analysis on burst keywords can help grasp the forefront of changes and trends in a certain research field by using Citespace to retrieve burst keywords from the basic data. A burst keyword map of vocabulary research in English over the past three decades has been formed. For details, please look at Figure 5 carefully.

In recent years, with the continuous deepening of foreign language education in China, there has been a clearer and deeper understanding of its essence. Its teaching is no longer constrained to vocabulary. Certainly, a multitude of teaching methods and tools are being used. Since the new century, under the promotion of advances in cognitive linguistics, corpus linguistics, and second language acquisition, four new changes have emerged in the research of vocabulary teaching in developed English-speaking countries: fine classification and calculation, massive data support, technical analysis methods, and intelligent development. (Ding Dao, 2020) Since the promulgation of the "curriculum standard", domestic English language teaching has attached great importance to integrating modern information technology and promoted the deep integration of English language teaching with technology, fully bringing the support and service functions of modern educational technology for teaching and learning into play.

This is totally different from the previous focuses of foreign language teaching in China (previously, traditional teaching methods were still mainly used, and vocabulary teaching only focused on aspects such as meaning, pronunciation, and part of speech). As shown in Figure 5, multi-modal teaching and corpora appear before and after this period-2017, and teaching models such as corpora based on modern information technology will become a major trend in domestic English vocabulary teaching. At the same time, the emergence period of "corpora" from 2018 to 2023 is relatively long, which proves that English vocabulary teaching during this period is mostly based on it.

In order to analyze the main research methods used in this field, this author first imports the selected 427 articles into a bibliography (named "English Vocabulary") located in the CNKI academic research app. Then, the articles are automatically coded based on the publication date, and every 61st piece of literature is randomly selected until the 427th article is reached.

Finally, the seven selected articles are read and classified into a table (details can be seen in Table 2), which provides an overview of the research methods used in English vocabulary studies.

From Table 2, it can be seen that there are both empirical research methods and qualitative research methods in the articles. There is no bias towards either method. Although qualitative research appears earlier than empirical research, it is still being used. In addition, data analysis tools are also utilized to review past research achievements, point out research deficiencies, and propose prospects for future research. Overall, the research methods are not extremely biased towards either method but are based on diverse analyses of various modern information technologies, greatly improving the reliability and effectiveness of analytical conclusions.

4. Research Prospects

The author utilizes the Citespace software and CNKI with a built-in visualization analysis function to draw graphs of publication volume and publishing institutions for 427 English vocabulary teaching-related articles under the three major journal categories. The following recommendations are given through in-depth analyses of a certain number of contents.

Firstly, in terms of English vocabulary teaching, it is encouraged for high-productivity authors to cooperate with each other to give full play to their leadership role. Ordinary authors can try to seek cooperation with those high-productivity authors or consult them on relevant issues in the field to gain valuable experience and improve their own abilities. Renowned scholars in related areas of domestic research can be invited to conduct special forums or workshops to discuss a new method or concept in the field.

Organizing public discussions on hot research topics during academic conferences is also beneficial for stimulating more scholars' interest and attention to hot topics and ultimately making the discussion more comprehensive and thorough. (Wen Qiufang, 2022) It not only strengthens communication among scholars but also promotes the development of English teaching in China, increases the volume in this area, and provides valuable experience for future research.

Table 2. Randomly selected samples

Research Methods	Year	Title
Qualitative research	2013	Exploration of English Vocabulary Teaching Based on Multimodality
	2022	Research on English Vocabulary Recognition Teaching
Empirical research	2018	Research on the Effectiveness of Academic English Vocabulary Learning Methods Based on ESP Corpora
	2019	Empirical Study of a Legal English Vocabulary Teaching Model Based on Online Corpora
	2019	Correlation Study between English Vocabulary Learning Strategies and Vocabulary Size of College Students from the Perspective of Autonomous Learning.
Literature review	2019	Analysis of English Vocabulary Acquisition Based on Online Corpora
	2021	Analysis of Research Progress in Teaching Medical English Vocabulary in China Based on CNKI (China National Knowledge Infrastructure)

Secondly, research institutions should be diverse and encouraged to collaborate at different levels. Major universities should work together and make use of their respective advantages in terms of school and region. At the same time, they should capitalize on the leading roles of higher education institutions in educational research in China, pay more attention to the development of secondary education, and cooperate with major middle and high schools. On the one hand, they can contact a more realistic and extensive educational environment and obtain more realistic experimental materials. On the other hand, it can also promote the development of English education in China and better connect the junior high school-senior high school-university education system.

In addition, non-English colleges and key English colleges should also work together, providing each other with sufficient experimental objects to facilitate interdisciplinary research and broaden research perspectives. In the context of the cross-disciplinary, comprehensive as well as integrated trends in science and technology and the constant promotion of interdisciplinary and liberal education in education, it is time to take action in English teaching. The predicament currently facing English teaching requires educators to seek new development paths and cultivate innovative talents that meet social needs. (Liu Yan, 2013).

Lastly, research methods should be diversified, and tools should be enriched. Starting from the 1950s and 1960s, social sciences began to draw heavily on empirical methods of natural sciences. In the 1980s-1990s, people detected the limitations of quantitative research methods. They started to pay attention to qualitative research again and its development, as well as improving methods and techniques. Today, there is an emphasis on combining qualitative and quantitative research methods, in other words, "Multi-angle verification", to avoid subjectivity and one-sidedness. (Liu Runqing, 2015) Generally speaking, mixed-methods research, which combines qualitative and quantitative research, has a wider audience. When it comes to exploring new methods of English vocabulary teaching or validating a hypothesis, Multi-angle verification often provides more profound, objective, and comprehensive data. Moreover, the rapid development of modern information technology has also provided possibilities for research previously limited by various practical factors. Advanced scientific tools such as SPSS, Citespace, and online corpora ensure the reliability and validity of experimental results while saving time and effort.

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