

Knowledge Graph Analysis of International Chinese Language Textbooks Based on CiteSpace

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Abstract: Drawing upon relevant papers from Chinese core journals and CSSCI source journals in the CNKI China Academic Journals Full-Text Database spanning from 1992 to 2023, this study utilizes CiteSpace as a research tool to visually analyze the knowledge graph structure of research on international Chinese language textbooks in China. The study maps out the publication timeline, authors, institutions, collaborative networks, and keywords pertaining to research on international Chinese language textbooks. The findings indicate that research on international Chinese language textbooks commenced early and continues to maintain a certain level of research interest, yet lacks sufficient research output. Research institutions predominantly reside in universities and publishing groups specializing in language or education, with collaboration between institutions being relatively scarce. High-frequency keywords in recent research on international Chinese language textbooks include “Chinese language textbooks for the Foreigners,” “Chinese language textbooks,” “Teaching Chinese Language for the Foreigners,” “Textbook compilation,” “International Chinese Language Education and Localization,” which reflect a diversified research perspective with interdisciplinary trends. Future research priorities encompass research on localization, customization of textbooks, and evaluation of textbooks which represent forefront directions of research.

Keywords: International Chinese language textbooks; CiteSpace; Knowledge graph; China

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1. Introduction

As the number of Chinese language learners increases and the scale of International Chinese Language Education expands, there has been a sharp rise in the quantity of international Chinese language textbooks, drawing increasing attention from experts and scholars. The development of textbooks relies on strengthened, innovative, and progressive theoretical research in this field. With this in mind, this paper aims to utilize literature from the CNKI database pertaining to research on international Chinese language textbooks as the basis of data. Using the information visualization software CiteSpace as a research tool, it analyzes the current trends in research on international Chinese language textbooks in China. Furthermore, it constructs a knowledge graph of research on international Chinese language textbooks in China, delineating the research hotspots,

frontiers, and evolutionary patterns in this field. The study explores the developmental trends in research, providing insights into the future development of international Chinese language textbooks.

2. Data source and research methodology

2.1. Data source

To ensure the comprehensiveness, accuracy, and interpretability of the raw data, this study selected *A Guide to The Core Journals of China* (hereinafter referred to as Chinese core journals) and CSSCI source journals from the CNKI China Academic Journals Full-Text Database as the sample data source. The search terms Chinese language textbooks and international Chinese language textbooks were utilized, with the article titles serving as the search approach. The search period spanned from 1992 to 2023. A total of 402 documents were retrieved. After excluding 104 documents that were not relevant to this field, such as conference solicitations, achievement introductions, book reviews, and reports, the study obtained 298 valid sample documents.

2.2. Research methodology

This paper comprehensively employed the analysis software provided by the CNKI database and CiteSpace software to analyze the sample documents. Firstly, using the analysis software provided by the CNKI database, the annual distribution of the sample documents was initially analyzed, and trends in the annual publication were depicted through graphical analysis. Secondly, CiteSpace was utilized to conduct corresponding data mining and quantitative analysis on the sample document data, extracting the knowledge base of research in the field of international Chinese language textbooks. This approach enables capturing the latest developments and cutting-edge topics in international Chinese language textbook research.

3. Statistics and analysis

3.1. Analysis of publication time distribution

Research on international Chinese language textbooks in China started relatively early, with the first relevant literature appearing in 1992. In terms of developmental stages, research on international Chinese language textbooks in China has gone through three stages: initial, development, and fluctuation stages.

- (1) Initial stage (1992–2003): A total of 49 documents were published during this period, with an average of 4.1 documents per year. Research output was relatively limited, and the quantity of publications fluctuated significantly, indicating that research on international Chinese language textbooks was in its infancy.
- (2) Development stage (2004–2014): A total of 149 documents were published during this period, with an average of 13.5 documents per year. During this stage, a large number of research outcomes emerged, especially between 2012 and 2014, indicating that research on international Chinese language textbooks gradually gained attention and recognition among Chinese scholars, with a steady increase in the number of publications.
- (3) Fluctuation stage (2015–present): There have been 100 publications on research related to international Chinese language textbooks during this stage, with an average of 11.1 publications per year. The quantity of papers has remained relatively high during this period. Compared to the development stage, there has been a slight decrease in the total number of publications, and the average annual publication rate has shown some fluctuations, indicating instability. Nevertheless, research on international Chinese language textbooks continues to maintain a certain level of interest (**Figure 1**).

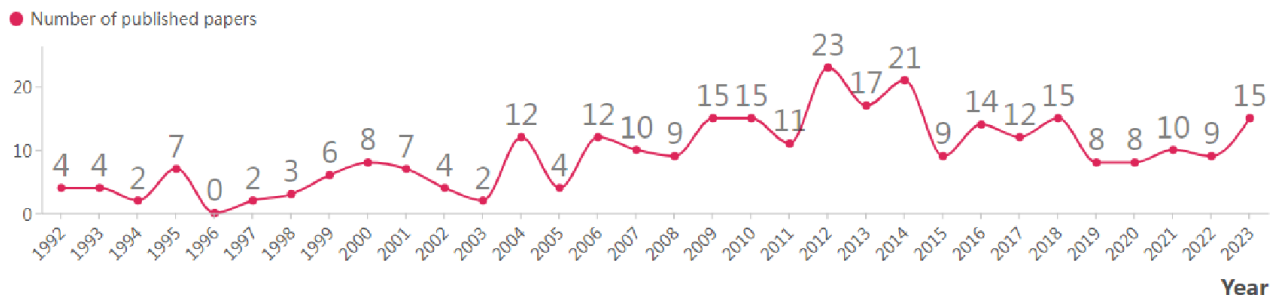


Figure 1. Annual trend of publications on research on international Chinese language textbooks

3.2. Analysis of authors, institutions, and collaborative networks in publications

Universities and their scholars are the core driving forces in the field of international Chinese language textbook research. In terms of publication quantity, researchers in China engaged in international Chinese language textbook research are relatively dispersed. The highest number of publications is attributed to Xiaobing Zhou (12 papers), followed by Quan Li (7 papers), Yu Liang (6 papers), and Defeng Yang, Nan Chen, Ying Zhang, Xiaohui Hu, Ruojiang Wang, each with 4 papers, while other authors have published fewer than 4 papers each. Authors with 4 or more publications account for only 3.6% of all authors. In terms of author collaboration, several research groups have formed in the field of international Chinese language textbook research, centered around authors such as Xiaobing Zhou, Xin Zhao, Peng Zhang, Nan Chen, Yali Liu, Quan Li, Yu Liang, Defeng Yang, Xue Gong, Liping Jiang, Xiaohui Hu, and Chen Zhang. However, there is still a lack of extensive academic exchange and close connections between these groups.

From the perspective of research institutions, the institution with the highest number of publications in international Chinese language textbook research in China is Beijing Language and Culture University (36 papers). Other institutions with more than 10 publications include Peking University (19 papers), Sun Yat-sen University (15 papers), Beijing Normal University (15 papers), Jinan University (12 papers), Renmin University of China (14 papers), and Xiamen University (12 papers). Notable scholars from Beijing Language and Culture University, such as Jinming Zhao and Yu Liang, mainly focus on the development and evaluation of international Chinese language textbooks.

In terms of collaboration between researchers and institutions, international Chinese language textbook research in China has formed several academic research groups centered around Sun Yat-sen University, which includes institutions such as Huizhou University, South China University of Technology, Yunnan Normal University, and related scholars such as Xiaobing Zhou, Xin Zhao, Peng Zhang, Yali Liu, Nan Chen, Li Zhang, Yu Luo, Qifeng Jin, and Yunming Shan. They conduct systematic research focusing on the keyword cluster politeness strategy and collaborate on research into the localization of textbooks. Specific research areas include the study of different components of textbooks, such as lexical and cultural systems, considerations of localization and cross-cultural factors, as well as the application and promotion of textbooks in different countries and cultural backgrounds. Additionally, cooperation networks have formed between Peking University, Beijing Language and Culture University, Renmin University of China, Shandong University, and researchers such as Defeng Yang, Liping Jiang, Yu Liang, Xue Gong, and Quan Li. They focus on collaborative research on the compilation, evaluation, and application of international Chinese language textbooks, covering specific areas such as the selection and design of textbook content, exploration of teaching methods, and construction of evaluation indicator systems. From the research collaboration network of international Chinese language textbook research (Figure 2), the overall density value is 0.0047, which is below the normal level

of 0.1, indicating a low-density and sparse network of cooperation lines among authors and institutions. This reflects relatively dispersed cooperation connections and a strong sense of independence among research institutions and authors in the field of international Chinese language textbook research, with a wide-ranging and closely connected academic cooperation network yet to be established.

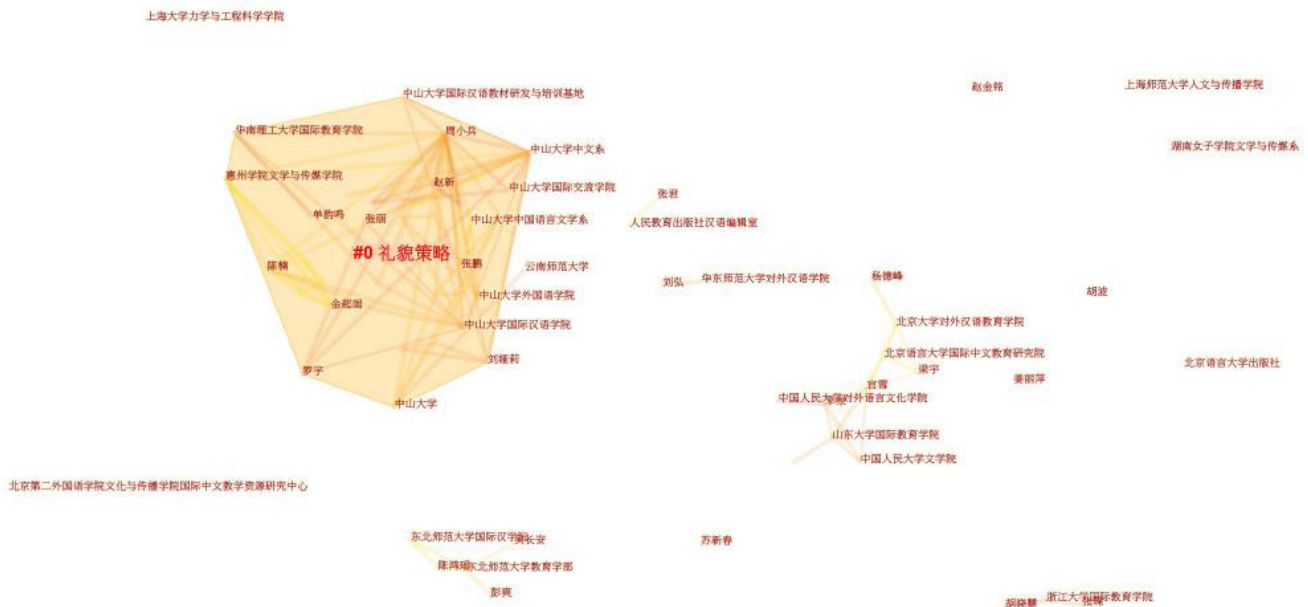


Figure 2. Knowledge graph of research collaboration in international Chinese language textbooks research

3.3. Keyword knowledge graph analysis

3.3.1. Co-occurrence network of keywords

Keywords are the core elements of research literature and can reflect the themes of the literature. By drawing a co-occurrence knowledge graph of keywords, the frequency of keyword occurrences and the relationships between keywords can be understood, thereby grasping the research hotspots, trends, and knowledge structure in the field. Utilizing CiteSpace's word frequency statistics function, the top 18 keywords with higher frequencies in international Chinese language textbook research were summarized in **Table 1**. The higher the co-occurrence frequency of keywords, the more prominent the research relevance and importance. The statistical results show that keywords such as "Chinese language textbooks for the Foreigners," "Chinese language textbooks," "Teaching Chinese language for the Foreigners," "Textbook compilation," "International Chinese language textbooks," and "International Chinese Language Education and Localization" have the highest occurrence frequencies, reflecting the focused areas and changes in international Chinese language textbook research during its advancement and development.

Using CiteSpace software, a co-occurrence knowledge graph of keywords in international Chinese language textbooks research was plotted (**Figure 3**). In the graph, larger nodes indicate higher keyword occurrence frequencies, more connections indicate more co-occurrences between keywords, and thicker connections indicate stronger relationships. It can be observed in the graph that keywords such as "Chinese language textbooks for the Foreigners," "Chinese language textbooks," "Teaching Chinese language for the Foreigners," "Textbook compilation," and "Nationalization" are located at the center of the graph, indicating their higher occurrence frequencies and research relevance in international Chinese language textbook research. Additionally, the co-occurrence network consists of 561 nodes and 1024 connections, with an overall density of

0.0065. Compared to research institution cooperation networks, the structure and performance of the keyword co-occurrence network have been significantly optimized and improved. However, the structure of the keyword co-occurrence network remains relatively loose with a low density. In the future, it is necessary to maintain sufficient focus on research topics, select appropriate topics for precise and in-depth research, and avoid superficial exploration.

Table 1. Ranking of high-frequency and high-centrality keywords in international Chinese language textbook research

| Serial number | Keyword | Frequency | Initial year | Serial number | Keyword | Frequency | Initial year |
|---------------|---|-----------|--------------|---------------|--|-----------|--------------|
| 1 | Chinese language textbooks for the Foreigners | 54 | 1992 | 11 | International Chinese language textbooks | 8 | 2021 |
| 2 | Chinese language textbooks | 38 | 1992 | 12 | culture | 7 | 1999 |
| 3 | Chinese Language Teaching for the Foreigners | 25 | 1995 | 13 | Localization | 6 | 2013 |
| 4 | Textbook compilation | 25 | 1995 | 14 | Textbook publishing | 5 | 2016 |
| 5 | Chinese as a Foreign Language | 23 | 1999 | 15 | Chinese Language Teaching as a second language | 5 | 1994 |
| 6 | textbook | 23 | 2001 | 16 | Promoting Chinese language to the world | 5 | 2006 |
| 7 | International Chinese Language textbook | 12 | 2013 | 17 | Chinese Language in the World | 5 | 2017 |
| 8 | International Chinese Language Education | 10 | 2021 | 18 | publishing house | 4 | 2006 |
| 9 | Nationalization | 10 | 2011 | 19 | Intermediate Chinese Course | 4 | 1992 |
| 10 | Chinese International Education | 8 | 2012 | 20 | Elementary Chinese textbook | 4 | 2001 |

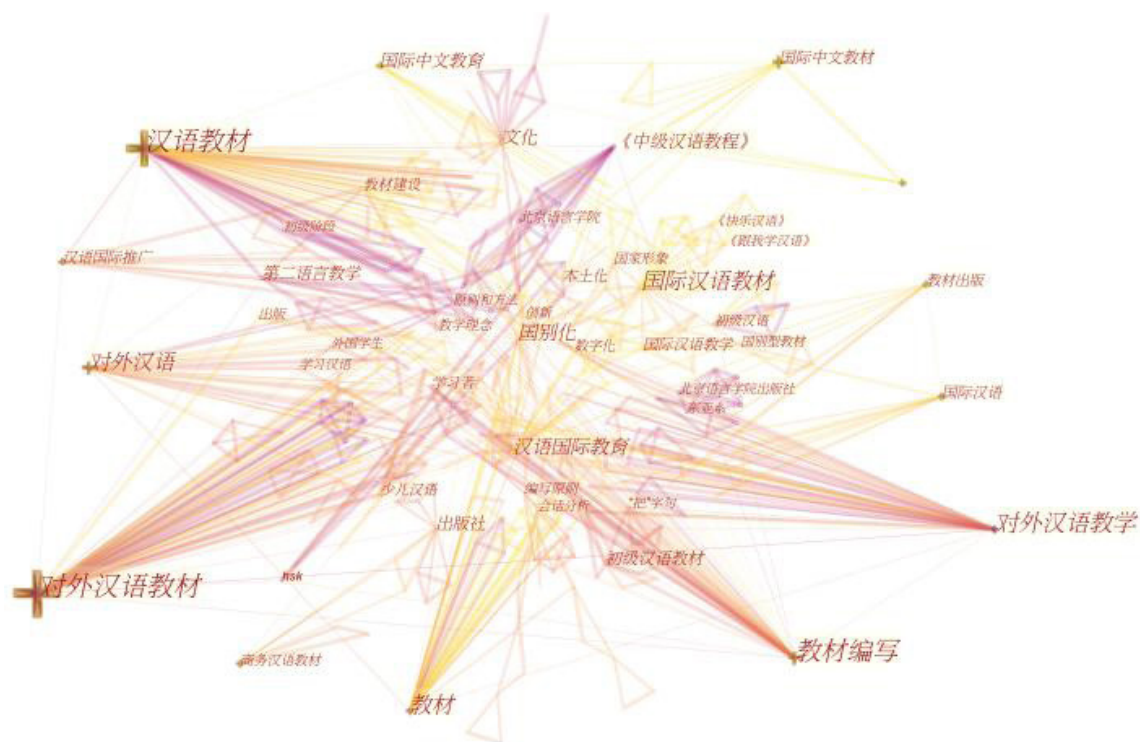


Figure 3. Co-occurrence knowledge graph of keywords in international Chinese language textbook research

3.3.2. Cluster analysis of keywords

Based on the co-occurrence knowledge graph of keywords, extracting cluster labels of keywords in international Chinese language textbook research can provide a deeper understanding of the research hotspots in this field. By using CiteSpace software's clustering algorithm, a cluster graph of keywords in international Chinese language textbooks research was plotted (**Figure 4**). Generally, a modularity value (Q value) greater than 0.3 indicates effective clustering, and a weighted mean silhouette value (S value) greater than 0.5 indicates reasonable clustering, with $S > 0.7$ indicating reliable clustering. In **Figure 4**, the modularity value (Q) of the co-occurrence graph of keywords in international Chinese language textbooks research is 0.7982, and the silhouette value (S) is 0.936, indicating that the clustering graph is effective and has high credibility characteristics.

As shown in **Figure 4**, the co-occurrence graph of keywords in international Chinese language textbook research forms 15 significant clusters of different sizes and colors: #0 Chinese language textbooks, #1 Chinese language textbooks for the Foreigners, #2 Characteristics, #3 textbooks, #4 Nationalization textbooks, #5 Chinese Grammar, #6 Intermediate Chinese language textbooks, #7 International Chinese Language Education, #8 International Chinese language textbooks, #9 culture, #10 Publishers, #11 compilation, #12 Chinese Language Teaching as a Second Language, #16 Chinese Language Teaching as a Second Language, #23 Chinese Language Teaching as a Second Language. Cluster numbers range from #0 to #23, and they are arranged in ascending order according to the number of documents contained in each cluster, indicating a decreasing volume of literature within each cluster. Overlapping parts between clusters represent their close connections. Combining the cluster graph of keywords with the literature, the research hotspots in international Chinese language textbook research can be categorized as follows.

One of the research themes in international Chinese language textbooks is theoretical research on the compilation of international Chinese language textbooks. Representative keywords in this theme include "textbook compilation ideology," "teaching ideology," "compilation principles," and "compilation methods." The research mainly explores the ideology, principles, and procedures of compiling international Chinese language textbooks. In terms of ideological compilation, the practice of textbook compilation relies on the guidance of textbook compilation theory. The theory of compiling international Chinese language textbooks is based on the research results of international Chinese teaching and continues to develop with the deepening research of linguistic theory and second language acquisition theory. The ideology of compiling international Chinese language textbooks is guided by language teaching theory and becomes richer with the development of language teaching methods. As Li believed, textbook compilation under the guidance of certain teaching theories has its vitality and broad development space ^[1]. The compilation of international Chinese language textbooks has gone through stages such as structural and syntactic stages, structural and functional combination stages, structural, functional, and cultural combination stages, and task-based stages. In this development process, the compilation of textbooks is guided by different language teaching theories, absorbs advanced teaching concepts and methods, and explores diversified ideas for textbook compilation according to learners' Chinese proficiency levels and needs. Regarding compilation principles, the general principles of international Chinese textbook compilation, such as scientificity, interestingness, targeting, and practicality, have gradually been accepted by academia and formed a consensus. Scientificity is reflected in the systematicity of language rules and the accuracy of language knowledge. Interestingness protects learning enthusiasm and stimulates learning motivation ^[2]. Targeting should be reflected in every aspect of textbook design and compilation, fully considering the targeting of learners ^[3]. Practicality should be aligned with the training objectives, adapting to social and user needs. These four principles provide important guidance for textbook compilation. Regarding

compilation procedures, Hu believed that textbook compilation should include three stages: preliminary preparation, development of teaching plans, and development of textbook compilation plans. In the preliminary preparation stage, sufficient theoretical and material preparations should be made. When developing teaching plans, comprehensive consideration should be given to ensure that the plans are targeted and operational. When developing textbook compilation plans, details such as the name of the textbook, users, usage time, content, format, division of labor, and schedule should be clarified ^[4].

Secondly, there is practical research on the compilation of international Chinese language textbooks. Representative keywords in this research theme include “compilation practice,” “textbook compilation mode,” “content compilation,” “textbook structural system,” “textbook system,” and “series textbooks.” This research is based on the analysis of various types of international Chinese language textbooks and explores the content elements and structural examples of international Chinese language textbooks. In terms of content elements, textbooks include both language elements and cultural elements. Language elements include pronunciation, Chinese characters, vocabulary, and grammar. Regarding the selection and arrangement of language elements, the quantity of language elements should be determined based on research and teaching experience, and the order of language element arrangement should be determined based on the guidance of language standards combined with student learning needs to ensure that the compiled textbooks are appropriately difficult and compliant with standards ^[5]. In the specific compilation of language elements, word selection should follow the principle of practicality, selecting words relevant to learners’ needs. Words can be classified into key and general vocabulary for arrangement ^[6]. The selection of grammar points should refer to the Chinese Proficiency Level Standard and Grammar Level Outline and be arranged from easy to difficult. The selection of cultural items should be representative and aligned with teaching stages. Additionally, the cultural differences of learners from different cultural backgrounds should be fully respected. In terms of the structural components of textbooks, they typically consist of vocabulary lists, texts, annotations, and exercises. Research on the structural components of textbooks primarily discusses the design and arrangement of each module. Concerning the structural components of textbooks, the modules should be clear and distinct, with each module being both independent and interconnected. This facilitates guiding students in making gradual progress and promotes the transformation of knowledge into communicative competence. Regarding the specific arrangement of modules, the selection of vocabulary items in the vocabulary list should consider the characteristics of the Chinese language and comply with the principles of second language vocabulary learning. The choice of word meanings in the vocabulary annotations should not deviate from the context of the text, and should not ignore the extended meanings and metaphors of words. It should be based on teaching objectives and coordinated with teaching methods ^[7]. The arrangement of texts should be student-centered, creating a diverse communicative environment. The design should focus on interactive activities rather than language knowledge, and the content arrangement should enhance systematicity. In the annotation section, grammar explanations should be simple, clear, and practical ^[8]. Annotations should elaborate on the semantic, grammatical, and pragmatic features of words, emphasizing individual characteristics. Examples should provide sufficient examples to demonstrate the distribution characteristics of words in sentences ^[9]. In the exercise section, exercises are a way of outputting learning. Well-designed exercises can help learners better output knowledge and skills. In terms of the relationship between input and output, exercises in textbooks should be interspersed with other modules, using a progressive or layered design, integrated as a whole ^[10]. Exercises in textbooks should pay attention to hierarchy, including comprehension, imitation, and memorization exercises as well as intellectual development and communicative pragmatics exercises ^[11].

The third aspect is the research on the nationalization of international Chinese language textbooks.

Representative keywords in this research theme include “transition,” “national-type textbooks,” “regional-type textbooks,” and “nationalization of textbooks,” among others. The research primarily explores the characteristics, principles, and strategies of localizing international Chinese language textbooks. Regarding conceptual clarification, Zhao advocated distinguishing between the concepts of internationalization, localization, and nationalization of Chinese international education. He pointed out that while the teaching methods and approaches should be internationalized, the Chinese teachers should be localized, and the Chinese language textbooks should be nationalized^[12]. Li and Gong stated that national-type textbooks are specifically designed for learners from certain countries and can be comprehensive or specialized skill-based materials^[13]. Wu suggested that the four elements of localized textbooks include localizing the content, native-language annotations for new words, comparative explanations for difficult points, and partial localization of topics^[14]. Regarding principles of nationalization, Sun believed in the importance of targeting and nationalization principles, which should be reflected in language item selection, grammar content arrangement, vocabulary selection and interpretation, handling of Chinese characters, and text content^[15]. Chen argued that the nationalization of textbooks should be in line with the country’s actual situation and teaching standards, establishing new teaching concepts^[16]. In terms of strategies, the development of localized textbooks should consider adaptability and differences in cultural factors, language habits, and teaching needs. International cooperation is an effective way to enhance the targeting of localized textbooks^[17]. It can fully utilize educational resources from both China and foreign countries, combine local needs and cultural backgrounds, and develop textbooks that better meet student needs, thereby improving teaching quality and effectiveness. Additionally, Zhou and Chen studied the one-edition, multiple-version Chinese language textbooks. They proposed recommendations for the localization compilation of one-edition, multiple-version textbooks based on the comparison of their localization features with overseas Chinese language textbooks^[18]. Although the secondary development of one-edition, multiple-version textbooks is not true localization, it has played an important role in addressing the shortage of localized textbooks and exploring the practice of localized textbook compilation. These studies provide important theoretical and practical references for the nationalization and internationalization of Chinese language textbooks, which are significant for promoting the development of Chinese international education.

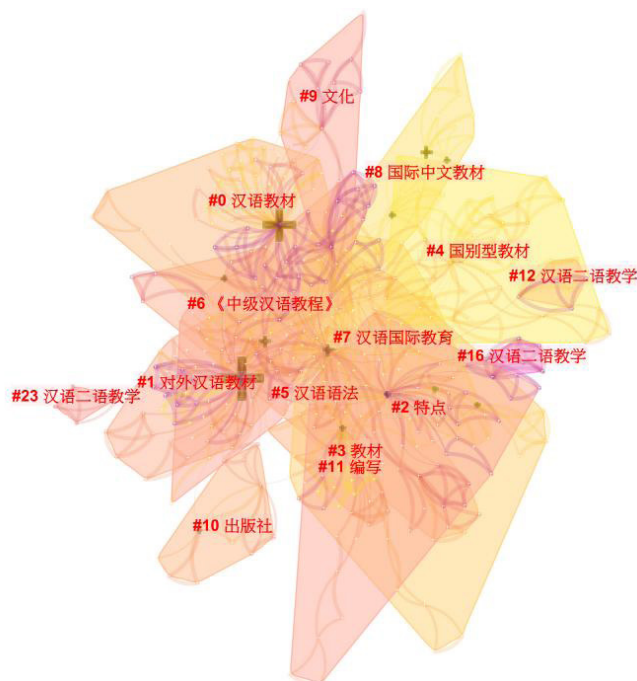


Figure 4. Cluster map of keywords in international Chinese language textbooks research

3.3.3. Development path of keywords

The emergence intensity of keywords can reflect the research areas with significant influence over a certain period. The list of words in the Strongest Citation Bursts obtained from the analysis of keywords in international Chinese language textbooks (**Figure 5**) demonstrates the distribution of Citation Bursts words over the years and their Citation Bursts strength. Building upon the keyword clustering analysis, a temporal co-occurrence graph of keyword clusters in the field of international Chinese language textbook research is constructed (**Figure 6**), illustrating the interactive relationships and evolutionary pathways among the clustered research topics over time. **Figures 5** and **6** collectively showcase the evolutionary path of the forefront of international Chinese language textbook research, highlighting the shifting trends of major research themes in different years. A comprehensive analysis of academic literature, temporal co-occurrence graphs of keywords, and graphs depicting the emergence rates of keywords aids in capturing the forefront trends in the field of international Chinese language textbook research.

From **Figure 5**, it can be observed that there are five emergent keywords: “Teaching Chinese language for the Foreigners,” “International Chinese Language textbooks,” “Chinese Language textbooks,” “International Chinese Language Education,” and “International Chinese language textbooks.” “Teaching Chinese language for the Foreigners” (4.37, 1995–2008), “Chinese Language textbooks” (3.69, 2015–2018), and “International Chinese Language Education” (5.79, 2021–2024) have continuously emerged as Citation Bursts words from 1995 to 2024, with fluctuations in Citation Bursts rates, reflecting increased attention to these keywords during the corresponding time periods. For instance, from 1995 to 2008, “Chinese language teaching for the Foreigners” was a focal point in textbook research. From 2015 to 2018, “Chinese Language textbooks” emerged as a Citation Bursts word, indicating the attention and significance given to Chinese language textbooks and teaching resources at that time. The increase in Citation Bursts rate of “International Chinese Language Education” from 2021 to 2024 suggests a heightened focus on international Chinese language education during this period.

Examining the emergence intensity and timing of keywords, research on Chinese international textbooks closely follows the trend of disciplinary development. After the World Chinese Language Conference themed Chinese Development under the Framework of Global Multiculturalism held in July 2005, “Chinese language teaching for the Foreigners” transitioned towards “International Chinese Language Education.” In 2012, the major of “Chinese language teaching for the Foreigners” was renamed as “International Chinese Language Education.” In December 2019, the International Conference on Chinese Education proposed the concept of International Chinese Language Education. In 2022, the major of “Chinese international education” was renamed as “International Chinese Language Education.” The corresponding research content of textbooks is significantly influenced by the changes in disciplinary development, demonstrating clear disciplinary guidance. After 2021, driven by China’s policy orientation and the new practical needs of International Chinese Language Education disciplines, issues related to International Chinese Language Education and international Chinese language textbooks have become the forefront of scholars’ research. Although the specific issues of research attention have changed, research on Chinese language teaching and textbooks has always been a focus. This conclusion is also reflected in the temporal co-occurrence graph of keywords (**Figure 6**). In terms of research on Chinese language teaching, **Figure 6** shows three clusters related to Chinese language teaching (clusters #12 Chinese as a Second Language Teaching, #16 Chinese as a Second Language Teaching, #23 Chinese as a Second Language Teaching), among which cluster #12 Chinese Language Teaching as a Second Language has a long research span and sustained attention from the academic community. In terms of research on Chinese language textbooks, **Figure 6** shows seven clusters related to Chinese language textbooks (#0 Chinese language

textbooks, #1 Chinese language textbooks for the Foreigners, #3 textbooks, #4 National-Type textbooks, #6 Intermediate Chinese Course, #8 International Chinese language textbooks, #11 Compilation). These keywords are closely related, with a long research time span and continuous attention from the academic community.

In summary, research on Chinese teaching and Chinese language textbooks has always been a hot topic. In different periods, new research hot spots have emerged with the changes in disciplinary development. From 1995 to 2016, research on Chinese grammar was particularly prominent, including teaching models for Chinese grammar, the compilation of grammar items in Chinese language textbooks, and the compilation of Chinese grammar textbooks as the main research content. From 1999 to 2016, cultural research gained attention from the academic community, including the integration of cultural elements into Chinese language textbooks and the implementation of Chinese cultural teaching, making the compilation of Chinese cultural textbooks a research hotspot. From 2013 to 2022, the research intensity on “national-type textbooks” rapidly increased, becoming the main research focus.

Overall, the compilation and promotion of “country-specific textbooks,” along with the “evaluation of international Chinese language textbooks,” have been relatively active in recent international Chinese language textbooks research. These areas may potentially become forefront trends in the near future, with emerging research findings gradually surfacing. This development is likely to provide an impetus for the construction and development of international Chinese language textbooks.

Top 5 Keywords with the Strongest Citation Bursts



Figure 5. Keywords of the Strongest Citation Bursts by initial year in research on international Chinese language textbooks

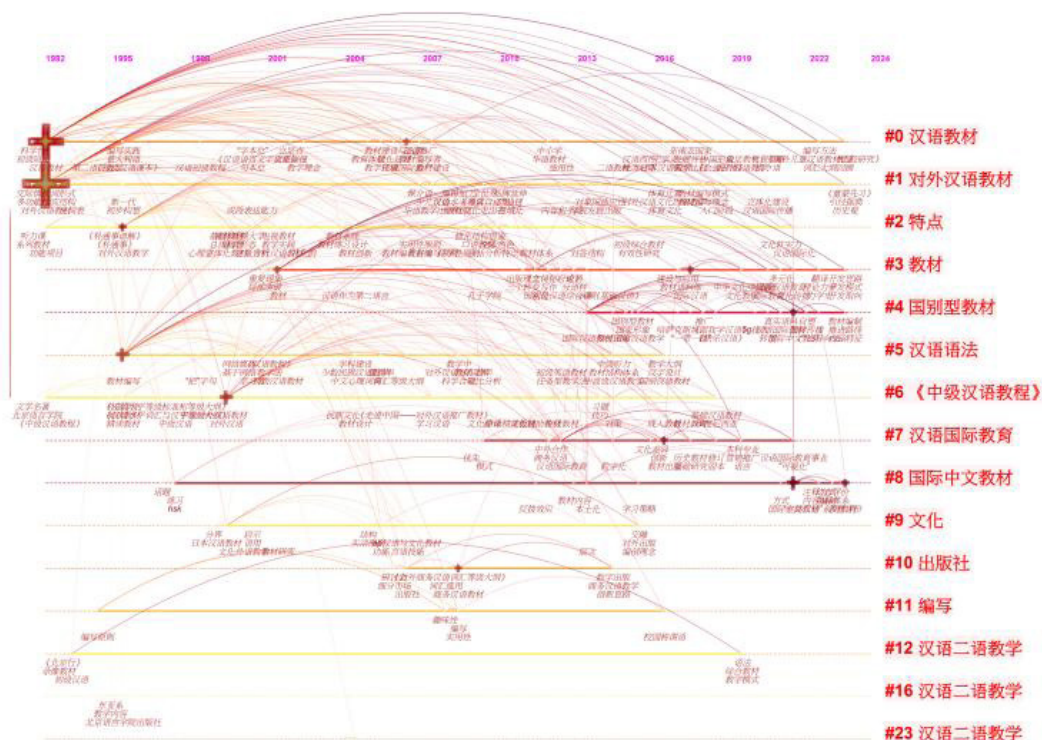


Figure 6. Temporal distribution map of keyword co-occurrence in research on international Chinese language textbooks

4. Conclusion and future prospects

4.1. Research conclusion

This study conducted different levels of analysis and visualization research on the literature related to international Chinese language textbooks in CNKI from 1992 to 2023 using CiteSpace software. The following conclusions were drawn:

- (1) The temporal distribution spectrum indicates that research on international Chinese language textbooks in China started relatively early, beginning in 1992. The quantity of related research gradually increased since 2004, reaching its peak in 2012, followed by a declining trend. Overall, there is still a certain level of research interest, but the quantity of research outcomes remains insufficient considering the significant development of Chinese international education. It is hoped that more researchers will focus on this field in the future.
- (2) The spatial distribution map shows that institutions involved in research on international Chinese language textbooks are mainly concentrated in universities and language or education publishing groups. Universities and their scholars are the core forces in this field, while the personnel engaged in research on international Chinese language textbooks are relatively dispersed. Existing research institutions are relatively independent, and cooperation between institutions is not sufficiently close. In the future, macro guidance is needed to establish long-term guarantee mechanisms and gradually promote communication and cooperation between scientific research institutions and researchers, forming mainstream research directions and promoting a virtuous cycle of research on international Chinese language textbooks.
- (3) The keyword co-occurrence map indicates that the hot topics in research on international Chinese language textbooks include Chinese language textbooks, Chinese as a second language teaching, textbook compilation, International Chinese Language Education, and localization. The network structure of keyword co-occurrence is relatively loose, with low density. In the future, researchers need to deepen their research on the research topics, content, and directions and produce more research outcomes.
- (4) The timeline map of research frontiers shows that the research frontier of international Chinese language textbooks lies in fields such as International Chinese Language Education, localized textbooks, and evaluation. From the perspective of research development, the research content has shifted from macro theoretical research to specialized field research, the research focus has shifted from universal textbooks to localized textbooks, the research direction has shifted from focusing on textbook compilation to focusing on textbook evaluation, and the research methods have shifted from qualitative analysis to a combination of quantitative and qualitative analysis. Future research needs to leverage new technologies to explore novel research directions, and interdisciplinary and cross-domain cooperation is necessary.

4.2. Research prospects

Future research prospects include strengthening research on the theory and practice of international Chinese textbook development in the context of new trends. Since the concept of International Chinese Language Education was proposed in 2019, there have been significant changes in the connotation and extension of International Chinese Language Education. The ecological landscape of International Chinese Language Education in the era of change has also undergone significant transformations, which will undoubtedly impact textbook development. Therefore, enhancing research on the theory and practice of international Chinese textbook development under new circumstances remains a key focus in this field. It is essential to actively incorporate innovative achievements in education theory and educational technology, and strengthen research

on textbook theory and development practices supported by information technology. This includes deepening research on corpus construction to provide more accurate and practical language materials for textbook development; exploring effective integration of textbook development with smart teaching platforms to achieve more targeted textbook development and teaching management; and investigating digital educational tools to assist in textbook development, thereby enhancing the scientific, standardized, targeted, and interesting aspects of textbook development.

The second prospect is strengthening research on the localization and indigenization of international Chinese language textbooks. With the continuous growth in demand for Chinese language learning globally, the development of Chinese language textbooks is moving away from a one-size-fits-all approach towards a more detailed and practical direction. In the future, the development of localized and indigenized textbooks will require a clear understanding of the target audience, an understanding of learners' needs regarding textbooks, an in-depth analysis of the strengths and weaknesses of existing textbooks, and a thorough investigation of the teaching characteristics of localized International Chinese Language Education. Additionally, it is crucial to fully consider local characteristics and cultural factors to better guide the development of localized and indigenized textbooks.

The third prospect is strengthening research on the evaluation of international Chinese language textbooks. Textbook evaluation provides a comprehensive understanding and assessment of the compilation process. Currently, textbook evaluation mainly consists of case-based analyses, review-style critiques, or sporadic studies on the construction of evaluation systems. In the future, there is a need to strengthen the establishment of an evidence-based evaluation indicator system, refine the practical operation process of evaluation, and apply it to the practice of textbook evaluation. Furthermore, there is a need to enhance the application research of evaluation results. Evaluation is not the endpoint but the starting point for improving textbook compilation. Research on the interaction between evaluation and compilation practice is essential to establish an effective feedback mechanism for evaluation results. This mechanism should promptly provide feedback to textbook writers so they can adjust and optimize their compilation based on evaluation results. Long-term tracking research should also be conducted on textbook adjustments and usage to understand the effectiveness of textbook usage and facilitate timely adjustments to the strategies of textbook compilation and evaluation.

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Disclosure statement

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