

# Status and trend of development of the higher foreign language education research-based on the analysis of citespace visualization

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**Abstract.** This paper presents a scient metric analysis of status and trend of development of the higher foreign language education using Citespace based on the 2313 research articles from the Web of Science core collection between 2000 and 2023. Based on previous studies, this paper proposes assumptions and data verification. According to the keywords, citations and relevant information in the selected literatures, the research carried out clustering analysis, timeline view and citation bursts analysis. It is found that there is a phased focus in the study of higher foreign language education and no obvious evolutionary trend was found in the data results for the new picture of interdisciplinary has not yet been formed. Besides, the impact of innovative technologies will have more and more influence on higher foreign language education.

## 1 Introduction

### 1.1 Background

Higher foreign language education is the core pillar of the country's construction of higher disciplines, training of specialized language talents and serving the country's foreign strategy. In the past 30 years, the global higher foreign language education has been faced with new situations such as language instrumentalization, open cultural conflicts, and extensive technological influence, and its research fields are characterized by multi-focus, pan-discipline, and integration. In 2019, China's education sector launched a new liberal arts reform, aiming to break through disciplinary boundaries and reshape the teaching ecology. Therefore, it is necessary to conduct in-depth research on the history and basic situation of higher foreign language education.

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## **1.2 Literature review**

### *1.2.1 Current situation and problems*

Higher foreign language education is facing new situations such as changes in the international environment, improvement of talent standards, and increasing complexity of cross-language communication. Therefore, efforts should be made to cultivate new foreign language talents with independence, creativity, and competitiveness (Vakulyk, I, 2023), and it needs inter-disciplinary and innovative foreign language talents (Li Guangjin, 2020) in terms of language opening, provincial distribution, training level and curriculum setting, etc (Zhang Sihong, 2023)

### *1.2.2 Reform and development path*

Since 2002, the arrival of big data has brought great challenges to foreign language education in the context of technological changes promoting the reshaping of the education system. On the one hand, it is necessary to pay attention to the influence of information literacy on the creativity of college foreign language teachers (Elnura, M, 2023), and improve online foreign language resources, especially instructional design to develop language competence. (Wang Binhua, 2020). On the other hand, through the establishment of the image of "big foreign language", higher foreign language education carries out the cross-integration of science, agriculture and medicine with foreign languages (Qu Wensheng, 2021), and focuses on cultivating excellent educational talents with solid academic foundation, rich teaching methods and flexible implementation methods (Teo, Peter, 2023).

### *1.2.3 Research methods of higher foreign language education*

In the context of innovative education, especially the rapid development of language intelligence represented by ChatGPT, it is of great significance to promote the digital transformation of foreign language education and build a deep, precise and professional subject knowledge map (Li Zuowen, 2023). Through the promotion of international, regional, institutional and author exchanges and cooperation (Garcia-Aracil, 2023) (Wang Xiaojing, 2020), the application of intelligent technology in linguistics (Zhu Ye, 2021), the design of English proficiency scale (Wang Luyang, 2019), and the professional competence evaluation criteria for foreign language teachers (Lee, Icy, 2020) are the main ways to improve the language skills and literacy of teachers and students.

To sum up, higher foreign language education has formed a rich research results, but the depth of research needs to be improved. Based on CiteSpace visual analysis, this paper makes data statistics on the historical evolution, concept development trend and content system construction of higher foreign language education, aiming to clarify the development path and reveal the future development direction.

## **1.3 Assumption**

Based on previous studies, this paper proposes assumptions and data verification for the following problems, draws a map of the current research situation of higher foreign language education from 2000 to 2023, and proposes key directions for the future development of higher foreign language education.

1. Research on higher foreign language education shows a phased trend with phased research focus.
2. Research on higher foreign language education shows an evolutionary trend, developing from a single dimension to a multidisciplinary direction.
3. The development trend of higher foreign language education is closely related to policy orientation and technological change.

## **2 Method**

### **2.1 Data collection and operating steps**

According to the keywords, citations and relevant information in the selected literatures, the research carried out clustering analysis and timeline view, which was mainly divided into: The first step was to identify the web of SCIENCE database as the source of information. The second step is to search " Higher foreign language education" in the core library of Web of Science and identify 2313 literatures from 20 0 0 to 20 2 3 as the analysis objects. In the third step, Citespace software was used to do the clustering analysis and timeline view

### **2.2 Visualization and analysis**

The latest version of Citespace (6. 1.R6) was used for visual analysis of literature data, including national collaboration network, author cooperation network, research hotspots, and outburst word analysis, among which keyword clustering, timing and outburst analysis were the key points.

#### *2.2.1 Clustering analysis*

Clustering analysis set grouping refers to the object of study, consisting of a similar object analysis process of multiple classes. When Citespace performs cluster analysis, it will cluster closely related keywords into one category.

#### *2.2.2 Timeline view*

Timeline view can directly reflect the research field of different times research content updates and related conditions.

#### *2.2.3 Citation bursts analysis*

Citespace can detect a large change in the number of citations in a certain period of time, to find the decline or rise of a single keyword. The intensity of keyword citation bursts represents its attention degree.

### 3. Results and discussion

#### 3.1 National ( regional) cooperation network



**Fig. 1** Map of co-occurrence words in countries (regions) (2000-2023).

**Table 1.** Top 10 countries (regions) for published documents and centrality (2000-2023).

Country	Count	Begin year	Country	Centrality	Begin year
<b>RUSSIA</b>	295	2012	<b>ENGLAND</b>	0.27	2006
<b>PEOPLES R CHINA</b>	276	2008	<b>USA</b>	0.26	2000
<b>USA</b>	273	2000	<b>PEOPLES R CHINA</b>	0.23	2008
<b>SPAIN</b>	221	2007	<b>SPAIN</b>	0.13	2007
<b>UKRAINE</b>	146	2018	<b>RUSSIA</b>	0.11	2012
<b>TURKEY</b>	131	2007	<b>NETHERLANDS</b>	0.1	2011
<b>ENGLAND</b>	101	2006	<b>GERMANY</b>	0.09	2003
<b>IRAN</b>	74	2011	<b>AUSTRALIA</b>	0.08	2008
<b>JAPAN</b>	72	2008	<b>ITALY</b>	0.07	2011
<b>GERMANY</b>	65	2003	<b>UKRAINE</b>	0.06	2018

In the co-occurrence words map of countries (regions), there are 117 countries and 331 correlation lines from 2000 to 2023. As shown in Figure 1 and Table 1, Russia ranked first in the number of publications (295), followed by China (276), the United States (273), and Spain (221). In Figure 1, the larger circular circle indicates that a country has more publications, while the color of the circle indicates the number of publications in different years. As a developing country, China has been conducting international research on higher foreign language education since 2008, with the second largest number of published documents, which can be said to have played a positive role in the global research on higher foreign language education. At the same time, Russia, Turkey, Ukraine, Iran and other countries have also conducted extensive research on this topic around 2010, and the research results are fruitful, indicating that higher foreign language education has been attached importance in emerging countries. From a regional perspective, European countries occupy 6 of the top 10 publishing countries from 2000 to 2023, among which Russia, the United States and Spain have more than 200 papers, indicating that higher foreign language education research has traditional advantages in the United States and Europe. From the point of view of time series,

taking 2008 as the dividing line of China's publication date, the publication date of developed countries is basically before 2008 , while developing countries are basically after 2008 . It can be seen that 2008 is a period of significant expansion of global higher foreign language education research and a significant increase in attention.

Centrality is an important index to analyze keywords in knowledge map. If the node data exceeds 0. 1, it indicates that the node is the central node and has a greater influence in the research. In Table 1, the centrality of the top 6 countries exceeds 0. 1, among which, the United Kingdom (0 .27), the United States (0 .26) and China (0 .23) began in 2006, 2000 and 2008, respectively, indicating that these three countries play a central role in the study of higher foreign language education. This data shows that the number of researchers studying English and Chinese is large, and the international communication power and discourse power are steadily increasing. In addition, the number of published papers in the Netherlands is only 28, but the research centrality is as high as 0. 1, which also indicates that the number of published papers is not necessarily related to centrality.

From 20 0 7 to 20 1 9 , the top 10 countries in the number of publications and centrality have closer academic networks. For example, the United States, China, Spain, and the United Kingdom have conducted extensive academic cooperation with other countries, while Russia, Japan, Turkey and other countries have a large number of papers, but the international cooperation is not close. From this point of view , countries should strengthen cooperation in higher foreign language education and research, and constantly expand the field of research.

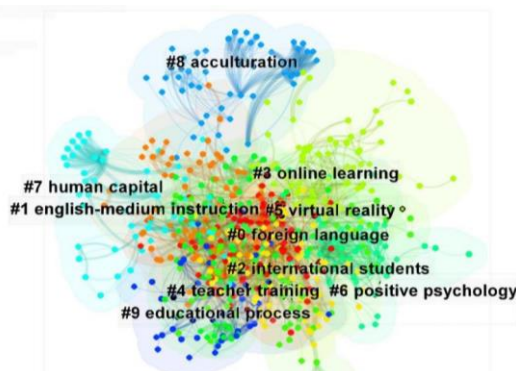
### 3.2 Research hotspots

**Table 2.** Top 10 keywords clustering and centrality (2000-2023).

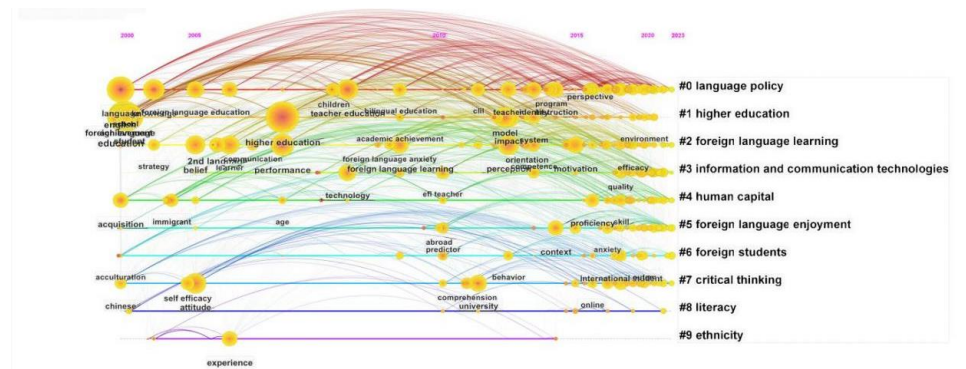
Keywords	Year	Count	Keywords	Year	Centrality	Count
higher education	2007	474	education	2000	0.18	269
education	2000	269	design	2003	0.1	8
foreign language	2000	237	impact	2012	0.09	87
English	2000	223	higher education	2007	0.09	474
student	2001	208	performance	2007	0.07	74
language	2000	177	knowledge	2003	0.07	60
motivation	2015	100	experience	2006	0.07	45
learner	2006	95	English	2000	0.07	221
teacher	2012	91	belief	2005	0.07	59
impact	2012	87	technology	2008	0.06	67

The key words are the highly condensed content of the article and the important guidance of the discipline construction. Table 3 shows the top ten academic keywords on the web of Science, among which higher education (474) contributed the most academic achievements, followed by education (269) and foreign language (237), accounting for 20 .5% , 11.6% , and 10.2% respectively. It is worth noting that after 2010, targeted studies on motivation (100) , teacher (91) and impact (87) have increased rapidly and come to the forefront, indicating that the academic community's understanding of the endogenous impetus of higher foreign language education to promote education development is gradually clear and the path is gradually broadened. As to centrality, both education (0 .14) and design exceed 0. 1,

indicating that these keywords have a great influence on the research topic. In particular, the number of publications on design is only 8, but the centrality is as high as 0.1, indicating that the number of publications is not necessarily related to the centrality of keywords.



**Fig. 2.** Top 10 keyword clustering network (2000-2023).

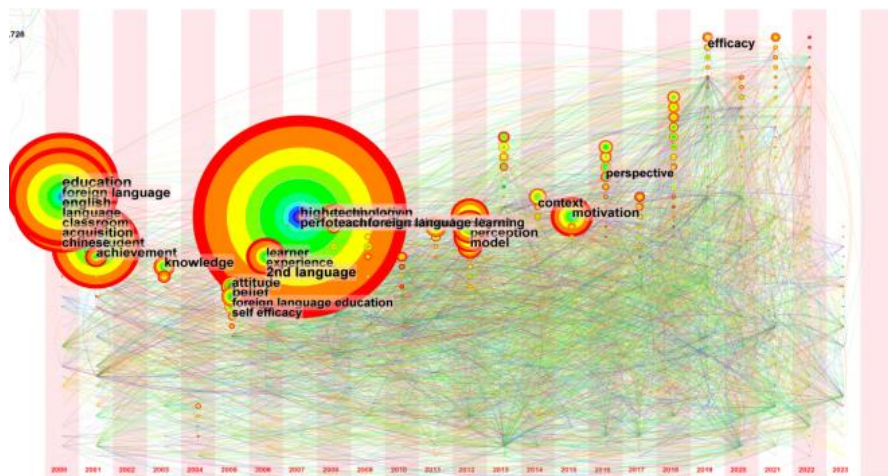


**Fig. 3.** Top 10 time sequence diagram of keyword clustering network (2000-2023).

In terms of keyword clustering structure, generally speaking, the clustering module value  $Q$  is between 0 and 1, and the closer the value is to 1, the closer the relationship between categories is. Generally, a value greater than 0.3 indicates that the clustering structure is significant. The average contour value  $S$  of clustering is generally between -1 and 1, with a value greater than 0.5 indicating that clustering is reasonable and a value greater than 0.7 indicating that clustering is convincing. Figure 4 shows the top 10 clustering results of the keyword clustering network.  $Q$  value is 0.51 greater than 0.3,  $S$  value is 0.79 greater than 0.7, the cluster structure is reliable.

### 3.3 Trend Analysis

In order to further clarify the development trend and provide suggestions for forecasting, a keyword time zone map is drawn (Figure 10). The larger the circle, the more frequently the keyword appears. The ring indicates the corresponding time. Lines represent associations between keywords. It can be found that according to the time series, the main research topics are: 2000 - 2023, learning attitude, English teaching, learning achievement. 2004 - 2010, Technology, Second Foreign Language, Self-efficacy. Cognition, Patterns, Motivation, 2011-2015. 2016-2023, Critical thinking ability, effectiveness.



**Fig.4.** Time zone chart of keywords in higher foreign language education research (2000-2023)

**Top 16 Keywords with the Strongest Citation Bursts**

Keywords	Year	Strength	Begin	End	2000 - 2023
care	2003	3.37	2003	2014	[Red bar from 2003 to 2014]
united states	2004	3.44	2004	2012	[Red bar from 2004 to 2012]
acquisition	2000	3.4	2013	2015	[Red bar from 2013 to 2015]
attitude	2005	3.9	2014	2017	[Red bar from 2014 to 2017]
language	2000	3.4	2014	2015	[Red bar from 2014 to 2015]
inequality	2015	3.15	2015	2018	[Red bar from 2015 to 2018]
language policy	2016	4.29	2016	2019	[Red bar from 2016 to 2019]
perspective	2016	4.07	2016	2018	[Red bar from 2016 to 2018]
human capital	2018	3.03	2018	2019	[Red bar from 2018 to 2019]
l2 motivation	2019	3.16	2019	2020	[Red bar from 2019 to 2020]
university student	2015	3.13	2019	2020	[Red bar from 2019 to 2020]
information technology	2020	3.49	2020	2021	[Red bar from 2020 to 2021]
online learning	2021	4.84	2021	2023	[Red bar from 2021 to 2023]
intention	2021	3.14	2021	2023	[Red bar from 2021 to 2023]
covid-19 pandemic	2021	3.14	2021	2023	[Red bar from 2021 to 2023]
distance learning	2009	3.08	2021	2023	[Red bar from 2021 to 2023]

**Fig. 5.** The citation bursts of 16 key words (2000-2023).

We can see some different trends in keyword citation bursts. In Figure 11, the blue bar represents the change of keywords over time, the red represents the outbreak year of keywords, and the intensity refers to the change of keyword frequency. In terms of intensity, online learning ranks first (4 . 84) , followed by language policy (4 .29) , perspective (4 .07) , attitude (3 .9) and information technology (3.49). It can be shown that higher foreign language education is deeply affected by the fourth technological revolution in the discipline system, and it is difficult to make an exception in learning ability, learning attitude and learning strategy. Look from the timing, intensity of the top five keywords outbreak period 2021-2023 , 2016-2019 , 2016-2018 , 2014-2017 , 2020 -2021 , both at 2018 -2019 before, during and after the rapid promotion of online teaching phases obviously. At the same time, online learning, intention, covid-19 pandemic and distance learning have been concentrated in 2021 -2023 , rising to the top 16 emergent words in just 2 years. It also shows that higher foreign language education is increasingly influenced by social environment, policy formulation and national orientation. Overall, attitude, acquisition and short lasting more than 14 years, such as learning period more than 3 years. Inequality, human capital, l2 motivation

Although the outbreak period is only one year, the intensity is high. Therefore, it can be predicted that the future higher foreign language education will be stable in terms of combining new technologies, exploring new models, paying attention to language connotation teaching and the endogenous motivation of learning objects. At the same time, problems such as talent cultivation characteristics, educational inequality and motivation differences should not be ignored.

#### **4. Conclusions and limitations**

Through literature analysis, we find that although there are many research directions in higher foreign language education, the depth is insufficient. Therefore, this paper visually analyzes the development of higher foreign language education in the past 20 years through country analysis, citation analysis, cluster analysis and emergent word analysis. According to assumption 1, the study found that higher stage focuses on foreign language education research existence, can be seen from the figure 10 and 11, 2012 years ago, focusing on the language acquisition method in 2012 -2015 is given priority to with learning motivation and cognitive model, 2015-2018 is given priority to with development prospects and education ethics, From 2018 to 2020, the focus is on talent training, and from 2020 to now, the focus is on technology-enabled foreign language education, which is consistent with the views of Chen Shen (2023), Anastasia Boldireff(2022) and others.

In view of the assumption 2, temporary not found in the data the evolution trend of the obvious, discipline overlapping new picture has not been formed. The intersection between foreign language education, management, computer science and other disciplines continues to increase. With the increasing specialization of foreign languages, the possibility of deep integration of other disciplines with foreign languages is worth looking forward to.

For assumption 3, research finds that higher foreign language education has been under the influence of technological change, as shown in figure 5. At the same time, some unpopular keywords have a great impact on the research topic, such as instructional design. As learners learn and work more and more dependent on the Internet, the impact of innovative technologies on foreign language research and related policy formulation will only deepen (Klimova Blanka, 2023), and become a major variable affecting the quality of teaching (Jianli Shi, 2023). The shortcomings of this article is that although do the rich visual data analysis, but deep meaning, multidimensional data for data interpretation and the development of Chinese higher foreign language education lack of further analysis. In 2019, China's education sector launched the "Four new" reform to promote interdisciplinary integration, aiming to cultivate talents who meet the national strategic needs and work standards. Therefore, the next research direction is: first, to update and clean the data and eliminate the duplicate data. The second is to conduct individual analysis of keywords and authors of cluster analysis to explore deep-seated phenomena and laws. Third, strengthen the targeted research on China's higher foreign language education and put forward constructive suggestions.

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