



# Research Status, Hotspots and Trends of Cross-border E-Commerce Talent Training in China - A Visual Analysis of Knowledge Graph Based on CiteSpace

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**Abstract.** With the rapid development of cross-border e-commerce under the influence of economic globalization and "One Belt, One Road", China is paying more and more attention to the training of cross-border e-commerce talents. 2020 epidemic swept the world, has the domestic view on the training of cross-border e-commerce talents changed? To this end, the author uses the CiteSpace analysis tool to visualize and analyze the research status, hot spots and trends of China's cross-border e-commerce talent cultivation in the past five years from 2018-2022 (retrieved on July 28, 2022) of CNKI China Knowledge Resource Consortium. The research results show that the hot spots in the field of cross-border e-commerce talent training in China are cross-border e-commerce, talent training, e-commerce talent, higher education institutions, business English, integration of industry and education, and Belt and Road. The research trends are industry-education integration, higher vocational colleges and universities, innovation and entrepreneurship, collaborative education, digital economy, new liberal arts, big data, etc.

**Keywords:** cross-border e-commerce, talent training, CiteSpace, visualization analysis

## 1 Introduction

According to the 2019 "State Council Report on Accelerating the Transformation and Upgrading of Foreign Trade and Promoting High-Quality Development of Trade", in terms of accelerating the cultivation of new trade patterns and models, the State Council has carried out the construction of cross-border e-commerce pilot zones in 35 cities, including Hangzhou, and explored the formation of a management system and practices centered on "six systems and two platforms". In 2018, the cross-border e-commerce retail import and export amounted to USD 20.28 billion, up 52.3% year-on-year. [1] In parallel with the rapid development of cross-border e-commerce, domestic scholars have conducted more and more research on cross-border e-commerce talent training at an increasingly large number and richer level. According to the 2021 Opinions on Accelerating the Development of New Foreign Trade Patterns and Modes, China's cross-

border e-commerce import and export volume reached 1.69 trillion yuan in 2020, an increase of 31.3%, and the scale of cross-border e-commerce grew nearly 10 times in five years. [2] In the context of China's acceleration of foreign trade new business model new mode, cross-border e-commerce rapid development. However, in the context of global epidemic, are the concerns of cross-border e-commerce talent training affected? What are the current status, hot spots and trends of research in the past five years? Although Huang Fangping (2019) analyzed the current status of research on cross-border e-commerce talent training model in the past ten years from 2008 to 2019, the impact of the epidemic context on cross-border e-commerce talent training has not yet been addressed. [3] Although Zheng Yueming (2021) and others have analyzed the research hotspots and trends of ITC talent training, they have not analyzed the research hotspot of cross-border e-commerce talent training in depth. [4]

To this end, the author uses the analysis method of CiteSpace knowledge graph to select the research literature in the field of cross-border e-commerce talent training in the past five years from 2018-2022 (retrieved on July 28, 2022), and conducts the visual analysis of knowledge graph on research topics, keywords, authors and institutions to find and summarize the current situation, hot spots of cross-border e-commerce talent training research in the past five years and trends in cross-border e-commerce talent cultivation in the past five years, and provide a basis for subsequent research on cross-border e-commerce talent cultivation.

## **2 Research methods and data sources**

### **2.1 Research Methodology**

CiteSpace is a practical software for visual analysis of scientific citations, which can visually present the current situation, hot spots and frontiers of research in various fields by visual means. At present, there are only seven visual analysis papers on cross-border e-commerce in China Knowledge Network Database (CNKI), and only one CiteSpace analysis paper on the field of cross-border e-commerce talent training, which can be seen that CiteSpace software has not been commonly used in the field of cross-border e-commerce talent training. In this study, CiteSpace 6.1.R2 with Java 18 environment was used to visually analyze the literature in the field of cross-border e-commerce talent training from 2018 to 2022 (July 28, 2022), and CiteSpace was mainly used for keyword clustering, keyword time zone, author, and institution mapping. In addition, Excel software was used for graphing.

### **2.2 Data sources**

In order to reflect the literature data comprehensively and extensively, this paper uses the China Knowledge Network (CNKI) database as the information source, adopts the advanced search method, sets the subject term as "cross-border e-commerce" and "talent training", sets the publication time as January 1, 2018 to July 28, 2022. A total of 1827 documents were retrieved, 1802 documents were obtained after deleting foreign language documents and retaining Chinese documents, and 1765 valid documents were

retrieved after deleting dissertations, conference reviews, news reports and documents with low relevance, and the documents were exported in reworks format as the sample for this CiteSpace visualization analysis was used as the sample.

### 3 Analysis of the current situation of cross-border e-commerce talent training in China

#### 3.1 Documentary chronological distribution

The literature retrieved from the database of China Knowledge Network (CNKI) with the theme of "cross-border e-commerce" and "talent cultivation" were counted according to the year, and the literature on cross-border e-commerce cultivation in China from 2018 to 2022 (retrieved on July 28, 2022) was plotted (Figure 1). In 2018 and 2019, the summit forums on cross-border e-commerce talent cultivation were held in Zhuhai and Wuhan respectively, and representatives from many universities and industries across China participated in the forums, which gradually increased the attention of schools, enterprises and so on to cross-border e-commerce talent cultivation. The outbreak of the epidemic at the end of 2020 will affect the development of e-commerce platforms and logistics, and the number of literature will drop in 2021. The attention of scholars to cross-border e-commerce talent cultivation declined slightly, but the number was still large. According to the data, it can be seen that there is only 1 article on cross-border e-commerce talent training in 2018, the number surges to 412 in 2019, continues to grow to 478 in 2020, declines to 325 in 2021, and currently has 128 in 2022. The number of literature from 2018 to 2022 shows a trend of first increasing and then decreasing, in which the lowest point occurs in 2018, the number is 1; the highest point occurs in 2020, the number is 478. the number of literature from 2018 to 2019 grows rapidly, the number of growth is up to 411, and the predicted value of the knowledge network in 2022 is 544, because the search date is July 29, 2022, the future literature in the field of cross-border e-commerce talent training will still grow. According to the current trend of literature publication, cross-border e-commerce talent training is still a hot spot of academic concern, and the heat of concern is expected to continue to increase in the future.

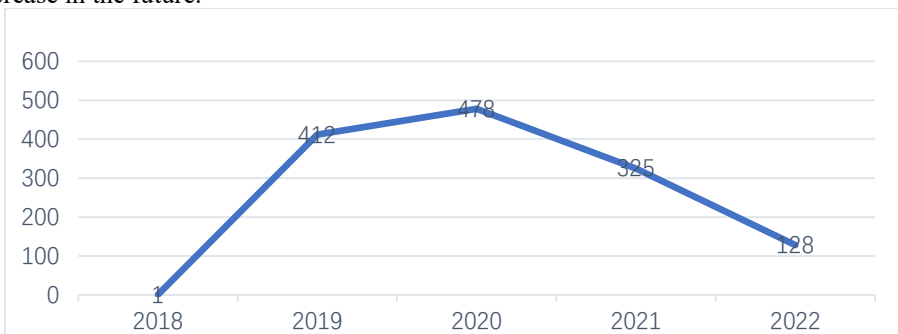


Fig. 1. China's cross-border e-commerce talent training literature number line graph

### 3.2 Literature sources

The literature on cross-border e-commerce talent training research from 2018-2022 was analyzed by source, and the total number of relevant literature issued in the top five journals were mall modernization, Popular Science and Technology Journal, Heilongjiang Foreign Trade and Economy, Modern Trade Industry, and China Trade and Modern Marketing (Business Edition) accounting for 39.19% of all literature, of which, mall modernization accounted for the largest proportion of 9.93%. This shows that there is a relative concentration of papers published in journals related to the training of cross-border e-commerce talents in China.

**Table 1.** Top 5 journals carrying articles on cross-border e-commerce talent training research

The serial number	Title	The literature number	Proportion
1	Modernization of shopping malls	57	0.0993
2	Popular Science and Technology Newspaper	46	0.0801
3	Heilongjiang Foreign Trade and Economic Cooperation	38	0.0662
4	Modern trade and industry	30	0.0523
5	China's trade	27	0.047
5	Modern marketing (management)	27	0.047

### 3.3 Analysis of highly cited literature

According to Figure 2, the publication time of highly cited literature in the field of cross-border e-commerce talent training is mainly concentrated in 2018 and 2019, indicating that scholars pay high attention to cross-border e-commerce talent training in these two years, and the literature in this time period has certain reference value. Among them, the literature occupying the first place is from Business and Economic Research, which has been cited up to 55 times, and this publication may receive more attention and recognition in the future.

### 3.4 Analysis of the author of the article

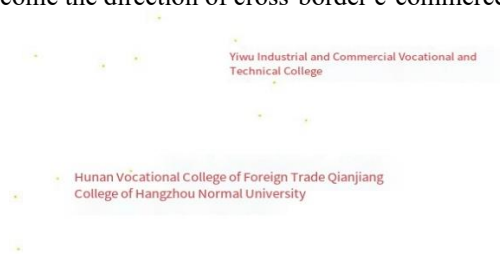
CiteSpace was used to obtain the graph of the main authors in the field of cross-border e-commerce talent training research with Node equal to 203 and Link equal to 30. Among them, Yuanyuan Ren issued the most articles in 2019, with the number of articles being 8, which reflects that he has a certain degree of concern for cross-border e-commerce talent cultivation. density equals 0.0015, which indicates that there is a lack of cooperation among scholars in China for research on cross-border e-commerce talent cultivation, and scholars can conduct more cooperative research in this field in the future to make more contributions to the field of cross-border e-commerce talent cultivation.



**Fig. 2.** Co-presentation of authors of cross-border e-commerce talent training releases, 2018-2022

### 3.5 Analysis of issuing institutions

The mapping of cross-border e-commerce talent cultivation issuing institutions with Node equal to 214 and Link equal to 6 was obtained from CiteSpace. density equals to 0.0003, which indicates that there is limited cooperation among various issuing institutions at present. Among them, Hunan Foreign Trade Vocational College and Yiwu Industrial and Commercial Technology College have more issuing articles, 21 and 19 respectively, indicating that these two schools pay more attention to the field of cross-border e-commerce talent training. The two Hunan Foreign Trade Vocational College is related to foreign trade, and Yiwu Industrial and Commercial Vocational College is located near Yiwu International Trade City, which reflects that cross-border e-commerce talent cultivation is not only closely related to the location factor, and cannot be separated from education cultivation. In the future, the integration of industry and education may become the direction of cross-border e-commerce talent training.

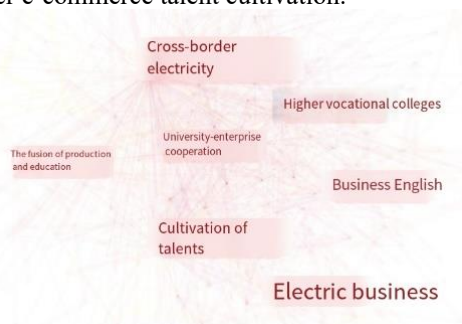


**Fig. 3.** 2018-2022 Cross-border e-commerce talent training issuing institutions co-existence chart

## 4 Hot spots analysis of cross-border e-commerce talent training in China

Keywords can quickly capture the general direction and theme of the research literature, and can objectively reflect the research hotspots in the field at different times, while the frequency and centrality of the keywords can be observed to grasp the importance and

influence of the keywords in the specific field. The data of 1764 documents retrieved with the subject terms of "cross-border e-commerce" and "talent training" were filtered and imported into CiteSpace visual analysis software, with the time zone sliced as 1 and the time span set as January 2018-2022. December (the retrieval time is July 28, 2022), and the node type is set to Keyword to obtain the keyword co-occurrence graph of cross-border e-commerce talent cultivation in China from 2018-2022. From the figure, it can be seen that the top seven keywords in the research literature in the field of cross-border e-commerce talent training from 2018 to 2022 are "cross-border e-commerce", "talent training", "business English", "higher education institutions", "school-enterprise cooperation", "industry-education integration", "innovation and entrepreneurship", and all of these seven key words have appeared in the literature in the field of cross-border e-commerce talent training in 2018, which indicates that academics have been paying attention to these seven directions in this field. Among them, the keywords of cross-border e-commerce and talent cultivation have a word frequency of 1294 times and 497 times, while business English, higher education institutions and school-enterprise cooperation all have a word frequency of more than 100 times, which shows that mastering business English is an important link in the process of cultivating talents for cross-border e-commerce, while higher education institutions and school-enterprise cooperation reflect that education, schools and enterprises all play a role. On October 18, 2017, Comrade Xi Jinping pointed out in the report of the 19th National Congress that the vocational education and training system should be improved and the integration of industry and education and school-enterprise cooperation should be deepened. [5] Higher education institutions, industry-education integration and school-enterprise cooperation have become a major hotspot for scholars in the field of studying cross-border e-commerce talent training in 2018-2022. In terms of centrality, the top five rankings are cross-border e-commerce (1.54), talent training (0.18), higher vocational institutions (0.07), school-enterprise cooperation (0.06), and business English (0.03). It can be seen that higher vocational colleges, school-enterprise cooperation and cross-border e-commerce talent cultivation are closely related, and higher vocational colleges, school-enterprise cooperation and business English play an important role in the field of cross-border e-commerce talent cultivation.



**Fig. 4.** Co-presentation of keywords for cross-border e-commerce talent training in China, 2018-2022

**Table 2.** Summary of core keywords for 2018-2022

Word frequency	Centricity	starting year	keyword	Word frequency	Centricity	starting year	keyword
1294	1.54	2018	Cross-border electronic commerce	90	0.02	2018	The fusion of production and education
497	0.18	2018	Talent training	70	0.01	2018	Innovative undertaking
121	0.03	2018	Business English	60	0	2018	The teaching reform
120	0.07	2018	Higher vocational colleges	58	0.03	2018	the Belt and Road
115	0.06	2018	University-enterprise cooperation	47	0.13	2018	Electric business

CiteSpace software was used to cluster analysis the 1765 documents screened from China Knowledge Network (CNKI) database, and cluster maps were obtained by sorting according to relevance. 8 clusters of money were selected in this paper: #0 cross-border e-commerce, #1 talent training, #2 e-commerce talents, #3 countermeasures, #4 higher education institutions, #5 business English, #6 integration of industry and education, #7 Belt and Road. The following will be the hot spot analysis in the field of cross-border e-commerce talent training from 8 clustering modules.

#0 Cross-border e-commerce China's cross-border e-commerce started late, but the development rate is very rapid, and cross-border e-commerce effectively promotes the development of international and domestic trade. Guo Siwei et al. (2018) systematically define the concept and definition of cross-border e-commerce, and point out that cross-border e-commerce in China has become an important part of foreign trade, and its role as a "new engine of foreign trade" should be given full play in the future. [6]

#1 Talent Cultivation The development of cross-border e-commerce cannot be separated from the development of cross-border e-commerce talents. The cross-border e-commerce talent team helps the deep development of the future cross-border e-commerce field. Sun Qi (2020) believes that the explosive growth of cross-border e-commerce is the new growth point of international trade, and points out that there are currently talent problems in cross-border e-commerce in China, and that China should review the structural changes of talent training in the future to promote the development of cross-border e-commerce. [7] Huang Fangping (2019) believes that cross-border e-commerce will have a great demand for composite and comprehensive talents in the future, and the "school-enterprise cooperation" talent training model will be the main one. [8]

#2 E-Commerce Talents Cross-border e-commerce talent training first requires the participation of e-commerce talents. Domestic universities have now opened international economics and trade, e-commerce and other majors for training comprehensive talents, which is of great significance to the development of cross-border e-commerce talents. And the academic community has put forward different educational concepts for e-commerce talents. Ding Lina (2022) proposes the development of "Russian +

cross-border e-commerce" composite talents under the concept of OBE education; [9] Mu Li et al. (2022) propose the idea of cross-border e-commerce talents in business administration. [10]

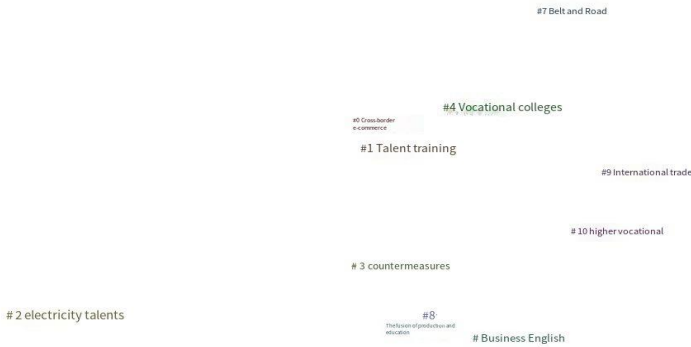
#3 Countermeasures There are opportunities and challenges in the process of cross-border e-commerce development, and there are advantages and shortcomings. For this reason, the process of cross-border e-commerce talent training also requires the right remedy for the problems that arise, which means that corresponding countermeasures are needed. Li Haibo (2018) points out the need to combine blockchain technology and Internet of Things technology while developing cross-border e-commerce; [11] Guo Junfeng (2018) believes that the peer-to-peer data transmission method and asymmetric encryption of blockchain technology can effectively solve many problems existing in traditional cross-border e-commerce. [12] In the future, cross-border e-commerce talents may need to understand and master blockchain technology and IoT technology, and efficiently apply the learned technologies in the specific practical activities of cross-border e-commerce.

#4 Higher Vocational Colleges and #6 Integration of Industry and Education While the talent cultivation model of school-enterprise cooperation is becoming more and more widely recognized, the cross-border e-commerce talent cultivation system in higher vocational colleges and universities in the context of integration of industry and education is receiving more and more attention from scholars. Li Min et al. (2022) proposed a cross-border e-commerce talent cultivation model for higher education institutions under the 1 + X system. [13] Chen Qi (2022) proposed a deep integration of school-enterprise cooperation and the construction of a scientific talent cultivation model. [14]

#5 Business English An essential course in the training program for cross-border e-commerce talents is Business English, which can be mastered to better communicate with the world. Therefore, business English is also a topic of concern for many scholars. Chen Yue (2022) points out that it is necessary to master certain social English and English language communication skills. [15] Wen Li (2022) argues that it is necessary to combine business English cross-border e-commerce with elements of Civics. [16]

#7 One Belt, One Road Cross-border e-commerce plays an important role in China's economic growth in the context of "One Belt, One Road". While cultivating cross-border e-commerce talents, we should not forget the general environment and background of "One Belt, One Road". Luo Na et al. (2018) point out the role of cross-border e-commerce in promoting China's import and export trade in the context of "One Belt, One Road". [17] Yang Ning (2019) believes that in the future, we can further cultivate new trade growth points, invest in infrastructure, and improve laws and regulations from a policy perspective. [18]





**Fig. 5.** Clustering chart of hotspots for cross-border e-commerce talent training in China, 2018-2022

## 5 Trend analysis of China's cross-border e-commerce talent training

Twenty-five emergent words were obtained by CiteSpace software for screening literature detection of cross-border e-commerce talent training. In general, cross-border e-commerce talent training has different hotspots and development trends at different times, and new hotspots often emerge. Among them, "teaching reform" and "innovation" were the first two terms to appear, but the attention declined in the later years. The terms "talent demand" and "curriculum" began to appear in 2019, picking up where the former left off, but they did not remain. It is worth noting that "collaborative education" emerged as a hot topic in 2020 and has remained hot since then. In 2021, "digital economy", "new liberal arts", "big data" and "double-loop" have been the key factors in the training process of cross-border e-commerce talents. In 2022, the training of cross-border e-commerce talents will still be based on "collaborative education", "digital economy" and "new arts". In 2022, the cultivation of cross-border e-commerce talents will continue to develop in various aspects and broad fields with the trend of "collaborative education", "digital economy" and "new liberal arts".

## 6 Conclusion

In the context of economic globalization and the "One Belt, One Road" initiative, the academic community in China has been paying more and more attention to the training of cross-border e-commerce talents. This paper uses the CiteSpace analysis tool to visualize and analyze the current situation, hot spots and trends of research on cross-border e-commerce talent training in China in the past five years in China Knowledge Network (CNKI) database. The research results show that: the current situation in the field of cross-border e-commerce talent cultivation in China is that there is still more room for authors to publish articles, and the cooperation degree of authors and institutions is low;

the research hotspots are cross-border e-commerce, talent cultivation, e-commerce talents, higher education institutions, business English, integration of industry and education, and Belt and Road; the research trends are integration of industry and education, higher education institutions, innovation and entrepreneurship, collaborative education, digital economy, new liberal arts, and big data.

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