



# Research Hotspot and Trends of International Students' Education in China

## ---A Bibliometric Analysis Based on SATI and SPSS

Huichun Ning<sup>1\*</sup>, Norazah Binti Abdul Aziz<sup>2</sup> Fang Yue<sup>3</sup>, Wenxuan Ren<sup>4</sup>

<sup>1</sup> Universiti Teknologi MARA; Jiangxi Tellhow Animation Vocational College

<sup>2</sup>Universiti Teknologi MARA

<sup>3</sup> Jiangxi Institute of Fashion Technology

<sup>4</sup> Zhejiang Ocean university

ninghuichun@163.com (corresponding author), norazahaa@uitm.edu.my,

yuefangmail@163.com, renwenxuan@zjou.edu.cn

### Abstract

This article used SATI3.2 software to process 488 documents related to international students' education from China Knowledge Network Database (CNKI). The collected data was from 163 core Chinese journals, published from 2009 to 2022. By using the visualized data quantitatively, it presented the current status of the main research hotspots of international student education. The influence of international education on China's economy and the role of Chinese cultural communication will remain a hot research topic in the field. Countries along the Belt and Road are and will be the driving force for the increase of students studying in China. The population of international students is increasing sharply and their needs in hosting universities are getting diverse, however, international students in China are an understudied population, and more research needs to be done on this group. we suggested that Chinese scholars should gradually shift from focusing on policy to concentrating on international students themselves at Chinese universities.

**Keywords:** *International Students Education; SATI; SPSS; Trends and hotspot*

## 1 INTRODUCTION

The internationalization of education is a crucial strategy for education development, and it is expected to contribute to the establishment of international economic cooperation and cultural integration [5]. The increasing number of international students in China is a vital component of the country's efforts to improve relations with other nations. Implementing the One Belt One Road (OBOR) initiative has created a new historical opportunity for China and international students. In 2018, over 0.49 million international students were from 196 countries and regions in China, and 53% were from areas and countries along with China's OBOR initiative [4]. Since then, China, the world's largest developing country, has become the third destination for studying abroad after the US and the UK.

## 2 INTERNATIONAL STUDENTS' EDUCATION IN CHINA

As of 2018, China became the most significant increasing country in terms of the number of international students worldwide. Most of them are from developing countries [3]. As for the top 5 countries that international students come from, South Korea is the biggest group, followed by Thailand, India, Russia, Indonesia, and Laos [3]. The One Belt, One Road, and other preferential policies are mainly responsible for the difference between international students' nationalities [3].

They can apply for various types of scholarships, including those from the government and local governments and those from private universities and companies. Chinese government scholarship recipients rose from 18,245 to 63,041 (BSIS, 2018). With the unpublished scholarship numbers awarded by local governments, enterprises, and high schools in China, the number of scholarships awarded to international students

is striking. Students from the countries that used the Silk Road and Maritime Silk Road routes are preferred to receive scholarship grants from China. The government's One Belt and One Road initiative is a key component of the country's development strategy. In 2019, the top 5 countries that received the most government scholarships were mainly Russia, Thailand, Pakistan, South Korea, and Argentina (Cheng, 2021).

Both degree and non-degree education are available for international students. Although the number of students pursuing degrees in China has increased over the years, the overall proportion of students studying for degrees is still low, rating 52.4% (BSIS, 2018). International students from developed countries focus more on language learning than those from less developed countries. The latter, however, are opting to take up academic courses. Twelve majors are available to over 5,000 international students in 2021, including Chinese Language, Engineering, Western Medicine, Management, Economics, Literature, Law, Traditional Chinese Medicine, Science, Art, Education, and Agriculture.

### 3 ANALYSIS OF CURRENT RESEARCH HOTSPOTS

In this paper, we use Statistical Analysis Toolkit (SATI) and social network analysis tools Net draw to visualize 488 Chinese documents from January 1, 2003, to May 26, 2022. The centrality analysis is performed by using SATI's field extraction, word frequency statistics, and matrix generation, and then SPSS is used to generate a visualized knowledge graph with keywords as the analysis object.

#### 3.1 Literature Data Collection and Methodology

This article used SATI3.2 software to process 488 documents related to international students' education from China Knowledge Network Database (CNKI). The collected data was from 163 core Chinese journals, published from 2009 to 2022, and the search date was May 26, 2022. This study analyzed data by using general econometric analysis, co-occurrence analysis, cluster analysis, multidimensional scale analysis, social network analysis, and other data analysis methods. Further, by using the visualized data quantitatively, it presented the current status of the main research hotspots of international student education.

#### 3.2 Keyword Extraction and Frequency Statistics

In this article, a total of 1981 original keywords were obtained. After combining keywords with the same meaning, such as unifying "one belt and one road" and

"one belt and one road initiative" into "The belt and road", and deleting the keywords of countermeasures, status quo, etc., the high-frequency keywords were selected based on the following criteria. The conditions for selecting high-frequency keywords are that the frequency is not less than 6 times, and finally, 26 high-frequency keywords are identified and sorted according to the frequency, as shown in Table 1.

Table 1: Keywords (part)

No	Keywords	Frequency
1	International students	183
2	Coming to China to study	34
3	"the Belt and Road"	86
4	Study in China for education	64
5	Higher education	30
6	Internationalization of higher education	35
7	Trade in Educational Services	18
8	The Confucius institute	16
9	Cross-cultural adaptation	12
10	Internationalization of education	8
11	The quality of education	8
12	Cultural identity	8
13	Study abroad education	8
14	Graduate education	8
15	Colleges and universities	8
16	Higher vocational colleges	8
17	Opening education to the outside world	7
18	Chinese Language International Education	7
19	Teaching Chinese as a Foreign language	7
20	Ideological education	6
21	Education policy	6
22	Graduate students studying in China	6
23	Asean Students	6
24	Chinese Government Scholarship	6
25	Sino-foreign cooperation in running schools	6
26	Cultivation of talents	6

### 3.3 Construction of Co-occurrence Matrix

The 26 high-frequency keywords identified by the frequency of keywords can largely reflect the focus and hotspots of domestic foreign students' research. In this paper, we constructed 26×26 co-occurrence variance matrices and frequency distribution matrices of high-frequency keywords by using SATI3.2 software (see Table 2, Table 3 and Figure 1).

The Equivalence coefficient method converts a multi-valued matrix into a similarity matrix (the formula is shown below), based on which a dissimilarity matrix can be generated. The values in the similarity matrix indicate the similarity between the matrix elements, and the higher the value, the stronger the association; on the contrary, the higher the value of the dissimilarity matrix, the weaker the association.

$$Sab = \frac{Fab}{Fa \cdot Fb}$$

In this equation, Sab is the value of the elements of the similarity matrix, Fab is the number of occurrences of keywords a and b together, Fa is the total frequency of occurrences of keyword a, and Fb is the total frequency of occurrences of keyword b.

Table 2: Dissimilarity matrix (Part)

*	International students	the Belt and Road	Study in China for education
International students	0	0.9409	0.9992
the Belt and Road	0.9409	0	0.9898
Study in China for education	0.9992	0.9898	0

Table 3: Yearly keyword matrix (Part)

Keywords	2019	2020	2021
The Belt & Road	27	13	7
Study in China for education	4	9	4
Higher education	8	3	2
Internationalization of higher education	2	3	3
Internationalization	2	8	0
Cross-cultural adaptation	1	2	1

Research themes can highlight the changes in research hotspots over time, while keywords are a deep distillation of the core content of a paper and a high summary of the research theme. The co-occurrence of keywords can clearly show the research themes in the research field, and thus help to analyze the research hot topics in the field. In this study, multivariate statistical analysis was conducted using multidimensional scale analysis to show the hot topics in rural community education more clearly. The Euclidean metric model in SPSS26.0 was selected to analyze the high-frequency keyword dissimilarity matrix, and a linear fitted scatter plot of high-frequency keywords in the field of foreign student education research was obtained (Figure 2).

The four major research themes in the field of international student education can be obtained by analyzing Figure 2, which are the research on the influence of the Belt and Road Policy on universities in China (Area 1), the research on cross-cultural adaptation and Chinese cultural communication of international students in China (Area 2), the research on teaching and curriculum of international students in China (Area 3), and the research on the influence of internationalization of higher education on China's service trade (Area 4). Based on the scatter diagram of the linear fit of keywords, the development status of each research topic can be analyzed in-depth in terms of its centroid and density. The horizontal axis of the scatter plot represents the centripetal degree and the vertical axis represents the density. A high centripetal degree indicates that the topic has extensive connections with other research hotspots and is closely related to other research; a high density indicates that the research topic is closely connected internally and the research tends to be mature.

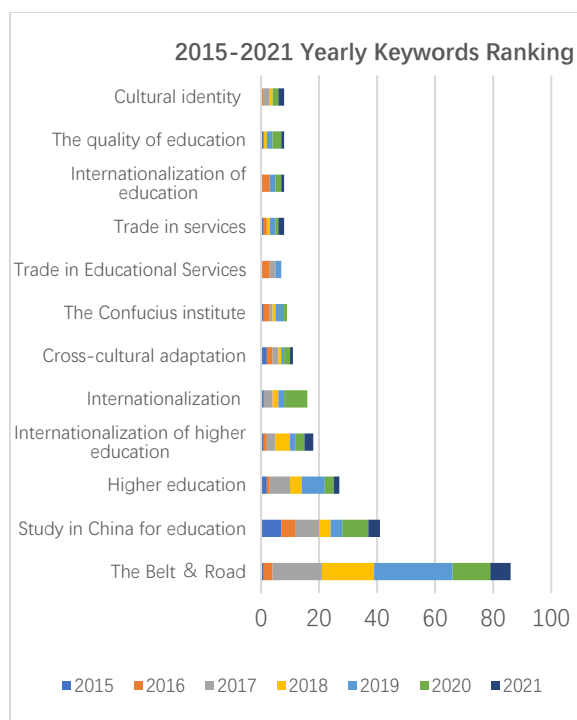


Figure 1 Yearly Keyword Ranking Table

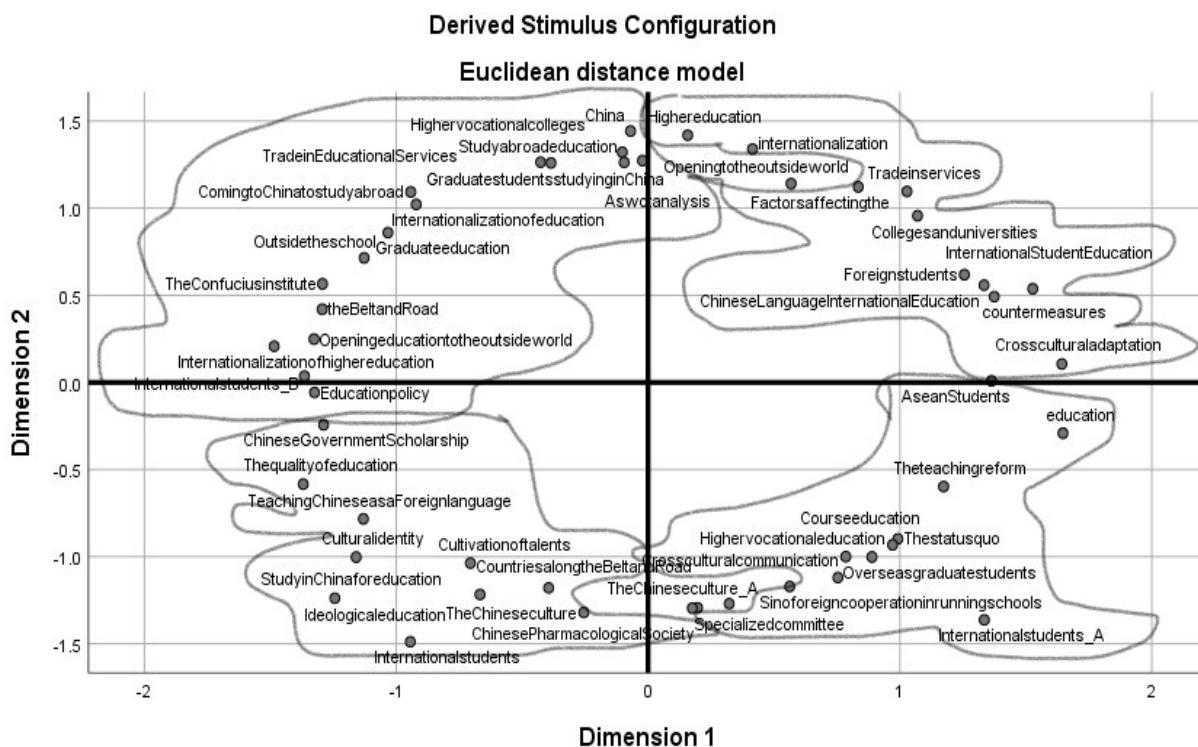


Figure 2 High-frequency Keyword Dissimilarity Matrix

#### 4 FINDINGS

From the visualized data results, research on international students' education in China can be divided into two perspectives: government policies and university management. As we can see from Fig 2, in

recent years, the research on the influence of government policies on international students in China is relatively hot, basically focusing on the influence of the Belt and Road policy on the service trade in the countries where international students come from; while the internal management of the university focuses on the

internationalization of higher education, the cross-cultural adaptation of students and the dissemination of Chinese culture.

From the perspective of teaching, there is research on curriculum setting for international students, scholarship setting management, intercultural education research, ideological and political education, etc. In recent years, more scholars are studying the Ideological and Political courses for international students, this is special for international students. On the contrary, the intercultural adaptation of international students during the period of COVID-19, which is of great concern to researchers worldwide, is only at the initial stage in China.

From the perspective of authors and institutions, only universities in China are conducting relevant research on international students. There are no enterprises or individuals involved. Unlike in other countries, where enterprises, governments, individuals, and universities are all engaged in research, the research institution in China is relatively modest. 488 papers that have been found in CNKI (Chinese National Knowledge Infrastructure) by using the keyword "international student." Between 2003 and 2022 the relevant study was inadequate.

There was a sharp increase in 2015 because the Chinese government issued the "One Belt and One Road" policy (OBOR). The policy has dramatically influenced the research direction of Chinese scholars [2]. These papers, as mentioned earlier, discussed the interpretation of the (OBOR) policy for international students, internationalization of higher education, Chinese language teaching, higher education export service trade, and student management. Twenty-two articles are relevant to international students' literary adaptation, social adaptation, and psychological adaptation. Additionally, there were two master's theses on the service satisfaction of international students and two doctoral theses on the adaptability of international students in China found in CNKI.

Chinese scholars study the education of international students from the policy on international students promulgated by the Chinese government, and most of the papers mention the "One Belt, One Road" policy or initiative, and the internationalization of education. Many works mention the government policy and the impact of the internationalization of education on China's foreign trade service, etc., and the policy orientation is obvious.

## 5 CONCLUSION AND IMPLICATIONS

The influence of international education on China's economy and the role of Chinese cultural communication will remain a hot research topic in the field of international students' education in the future.

Countries along the Belt and Road are the driving force for the increase of students studying in China. At present, the international students in China mainly come from China's neighboring countries and countries with close economic exchanges such as the United States, France, and Germany, and the increase of international students in Countries along the Belt and Road is obvious. Among the top 15 countries of origin in terms of students, all of them are countries along the Belt and Road, except South Korea, the United States, Japan, France, and Germany. Students from these countries are of great significance to the future construction and development of the Belt and Road.

International students' education in China is in various situations. Research on this topic should gradually be shifted from focusing on policy to concentrating on students themselves at Chinese universities. Moreover, international students in China are an understudied population, and more research needs to be done on this group [1].

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