Internationalization Evolution of Vocational Education in China (1949-2023): The Knowledge Mapping of Research Overview and Hot Trends

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ABSTRACT

The internationalization of vocational education (IoVE) plays a pivotal role in facilitating economic structural transformation and upgrading, while also serving as a critical foundation for the country's foreign strategic initiatives. To systematically explore the research landscape of China's IoVE, this study conducted a comprehensive scientometric analysis using CiteSpace 6.2.R4, examining 2334 references from the Web of Science (WoS) core collection, Scopus, CNKI, and CSSCI databases spanning the past seven decades. Key analytical techniques, including keyword co-occurrence, author collaboration, term clustering, and timeline-timezone visualization, were employed to uncover scholarly cooperation patterns, research hotspots, and developmental trends. The findings revealed several critical insights. First, despite limited collaboration among scholars and institutions, research topics in IoVE are diverse and multidimensional, with distinct thematic emphases between Chinese and Western scholars. Notably, while sustainable development emerged as a reinforced theme through vocational education's transition and upgrading, poverty alleviation and rural revitalization remained underrepresented in IoVE discourse. Institutionally, vocational colleges dominated research output, followed by undergraduate universities and research institutes, though significant regional disparities and uneven financial support for IoVE initiatives were evident across China. Historically, China's IoVE development progressed through five distinct stages: The emergence and tumultuous development period (1949-1979); the recovery and initial development period (1980-1994); the speed-up period (1995-2005); the connotative development period (2006-2013); and the current transition and upgrading period (2014-present). Accordingly, this study suggested that to enhance China's internationalization of vocational education (IoVE), four key measures should be implemented: (1) transforming societal perceptions to recognize vocational education as equally important as general education, (2) strengthening multi-level cooperation among scholars, institutions and enterprises through resource sharing and joint programs, (3) optimizing regional resource allocation with targeted government policies to address development imbalances, and (4) establishing diversified funding mechanisms with increased government investment to ensure sustainable development.

Keywords: visualization analysis; internationalization; vocational education; China

INTRODUCTION

Over the 70 years after the founding of the People's Republic of China, vocational education has played a pivotal role in driving economic transformation and poverty alleviation, lifting over 770 million people out of poverty

and aligning with the United Nations' Sustainable Development Goals (SDGs). Among its critical dimensions, the internationalization of vocational education (IoVE) has emerged as a strategic priority, facilitating cross-border skill exchange, global education governance, and the cultivation of talent for China's expanding global engagement (Council, 2021). However, despite its practical importance, the conceptualization of IoVE has remained under-theorized, limiting a deep understanding of how it balances domestic development needs with international collaborative objectives.

Education internationalization, as defined by Knight (1993), encompasses the process of intefrating an international, intercultural, or global dimension into the purpose, functions, and delivery of education. Drawing on Knight's (2003) framework, IoVE uniquely embodies principles of competency-based education, which emphasizes practical, industry-aligned skill development. IoVE operates through technical competency transfer, cross-cultural collaboration, and policy alignment (Lei et al., 2022; Li and Pilz, 2023). These dimensions highlight IoVE's role as a bridge between local skill demands and global educational norms.

Existing research on IoVE has described practices like "going out" models and policy evolutions but has not sufficiently embedded these within theoretical frameworks that reconcile China's unique "government-college-enterprise" tripartite model with global education theories (Guo et al., 2019). For example, how does China's emphasis on "industry-education integration" interact with internationalization? And how can IoVE leverage SDG 4's goal of inclusive technical education to address global skill disparities, particularly in developing regions? These unresolved questions create a gap in understanding IoVE's dual function as both a domestic development engine and a tool for international cooperation.

This study addresses these gaps through a scientometric analysis of 70 years of IoVE research, aiming to: 1) map collaboration patterns among scholars and institutions, 2) identify thematic clusters and emerging trends, and 3) trace historical phases of IoVE through policy and practice. As China transitions to a more active role in global education governance, clarifying IoVE's conceptual boundaries is essential for fostering sustainable, equitable international partnerships that align with both national development strategies and global SDG targets.

LITERATURE REVIEW

The term internationalization was not introduced into the education system until the 1980s. However, it was until the 1990s that internationalization was combined with vocational education. Initially, studies on the internationalization of vocational education (IoVE) mainly focused on experiences from other countries, including the concepts, strategies, challenges, policies, influences, etc. As China's reform and opening-up continue to deepen, its connections with other countries are becoming increasingly close. The path towards IoVE is widening, and there are also increasingly more research fields related to IoVE. Yuan and Chen (2019) analyzed the European Union's relevant policies on IoVE and put forward that China's IoVE is still at the exploratory stage and should learn strategies from the European Union. Mo (2019) concluded that presently, China's IoVE has taken shape through a diverse set of approaches, including "going abroad", "bringing in", and "international participation", but its development varied widely among regions, and analyzed the reasons as well as suggestions to reform. Wang (2018) analyzed 42 national policy texts on IoVE and concluded four stages of China's internationalization policy on vocational education over the past 40 years. The Belt and Road Initiatives (B&R) provided new research directions for IoVE. Therefore, a great many scholars conducted research on IoVE from the perspective of B&R. Yang and Xiao (2019), from the perspective of higher vocational education, analyzed its internationalization development and put forward existing problems as well as suggestions that IoVE should take to better serve the construction of B&R. Other scholar analyzed the current talent training issues toward IoVE under the background of B&R and put forward practical suggestions (Yang, 2023).

All these studies suggested that IoVE is a hot topic in China and has been widely studied. However, from the perspective of the research method, it is found that most of the research is based on literature review methods,

and there are very few studies that have utilized scientometric methods. Guo et al. (2019), by using CiteSpace, conducted scientometric research related to IoVE over the past 10 years. However, they mainly focused on comparing the differences between undergraduate studies and the internationalization of higher vocational education. Liang and Shi (2018) visualized the hot topics of IoVE over the past 40 years. Only one article used the scientometric method to analyze the internationalization trends of education over the past 70 years (Cai et al., 2020), but this article focused on the internationalization of higher education. Therefore, it is concluded that presently, no scientometric articles have studied the internationalization trends of vocational education over the past 70 years since the founding of the People's Republic of China. However, such studies are significant for scholars to comprehensively capture the development process, present status including major scholars, and institutions, and future research trends of IoVE. Therefore, this study, by using scientometric methods, aims to answer the following questions.

Q1: What is the present status of co-authors in relation to IoVE?

Q2: What is the level of institutional attention on IoVE?

Q3: What are the hot topics and emerging trends of IoVE in China?

Q4: How has the IoVE developed in China over the past 70 years?

RESEARCH METHODS

Research Software

CiteSpace 6.2.R4 visualization software was used to conduct this study. Developed by Professor Chen Chaomei, this software can be used to utilize data mining, information processing, knowledge metrics, and graphical visualization to present a field of scientific research (Liu et al., 2008). It is an information visualization and analysis software that can be used to search for landmark, hub, and pivot nodes, and detect and track the evolution of a research domain (Chen, 2006). The maps of collaboration networks of keywords, institutes, and countries, as well as the burstiness and clustering maps created by CiteSpace, can comprehensively and directly present the research content, development process, topics, and research frontiers of relevant study fields. Therefore, this study aims to provide a comprehensive review of the development of internationalization of vocational education in China over the past 70 years through CiteSpace.

Data Collection

Since our study mainly focused on the internationalization situation of China's vocational education. China National Knowledge Infrastructure (CNKI) and the Chinese Social Sciences Citation Index (CSSCI) were decided to be the main data sources. In the meanwhile, to include relevant articles in this field as completely as possible, Web of Science, and Scopus were also used to search data related to China.

Since the term "internationalization of vocational education" has several Chinese versions, in CNKI, by using advanced search with the Chinese search string "SU=职业教育*国际化 OR SU= 职业教育*国际交流 OR SU= 职业教育*国际合作 OR SU= 职业教育*国际交流与合作 OR SU=职业教育国际化", the time limited to from October 1st, 1949 to August 31st, 2023, a total of 2597 publications were retrieved. After excluding conference papers, meeting abstracts, editorial materials, book chapters, newspapers, book reviews, letters, conference notices, and profile interviews, 2273 publications were gathered. Time limitations were not set in CSSCI, Web of Science core collection, and Scopus because the earliest articles were published within the time limits. Therefore, in CSSCI, with the same search string and time limitation, we extracted 17 articles. In the Web of Science Core Collection, by using the search string Topic= "vocational education" AND "international*"

AND (China OR Chinese), three articles were gathered. In Scopus, by using advanced search with search string TITLE-ABS-KEY ("vocational education" AND international* AND (china OR chinese)) AND (LIMIT-TO (DOCTYPE, "ar")) AND (LIMIT-TO (SRCTYPE, "j")) AND (LIMIT-TO (LANGUAGE, "English")), 49 articles were retrieved. All these searches were conducted on August 31st, 2023. After removing duplications, 2334 articles were remained for further analysis.

In the process of parameter setting of CiteSpace, Time was set from October 1949 to August 2023 with 5 years per slice. Node types were set separately according to relevant analysis. Selection criteria used g-index with k= 25, and pathfinder was used to prune the network. If the network is not appropriate, relevant parameters will be adjusted, otherwise, this is the default set.

RESEARCH RESULTS

Collaboration Analysis

Author Collaboration Analysis

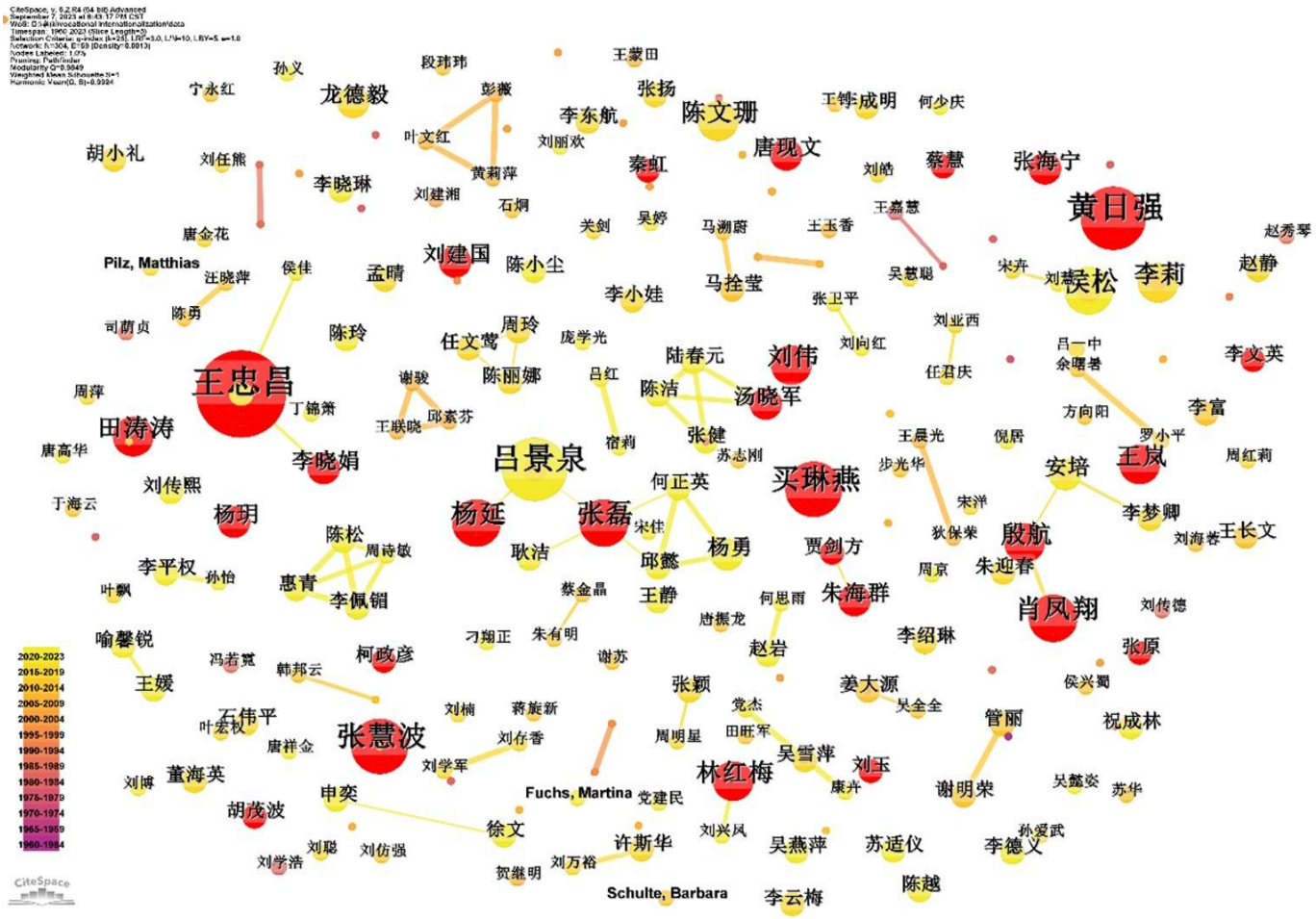

Figure 1. Author collaboration network

The links between authors in the author collaboration network (Figure 1) represent their cooperation situations. As shown in Figure 1, scholars didn't conduct in-depth cooperations in this field, most scholars worked individually. This isolation may stem from institutuial incentives favoring individual productivity over team research, as well as the interdisciplinary nature of IoVE, which requires integration of education, economics, and international relations - a challenge for scholars rooted in single disciplines. Although some scholars, for instance, Mai Linyan (买琳燕), Zhang Huibo (张慧波), Huang Riqiang (黄日强), etc., had high volumes of

articles, they also worked individually, showing a singly node in the figure. Despite that, there were still several relatively stable cooperative teams, such as the four-member teams formed by Chen Song (陈松), Hui Qing (惠青), Li Peimei (李佩镅), and Zhou Shimin (周诗敏); Zhang Jian (张健), Chen Jie (陈洁), Lu Chunyuan (陆春元), and Tang Xiaojun (汤晓军); Zhang Lei (张磊), Qiu Yi (邱懿), Yang Yong (杨勇), and He Zhengying (何正英); the three-member teams formed by Ye Wenhong (叶文红), Huang Liping (黄莉萍), and Peng Wei (彭薇); Wang Lianxiao (王联晓), Qiu Sufen (邱素芬), and Xie Jun (谢骏); Ren Wenying (任文莺), Chen Lina (陈丽娜), and Zhou Ling (周玲). Moreover, the results in Figure 1 suggested that there is limited cross-unit cooperation, as most of the members of one team came from the same work unit, highlighting the need for policies to incentivize inter-institutional partnerships. In addition, 27 high-impact scholars with strong citation bursts were also detected, which were shown with red nodes in Figure 1. To excavate the deep information of the author collaboration network, Table 1 listed the top ten most productive authors and their citation bursts.

Table 1. Top 10 most productive authors and citation bursts

Authors	**Count**	**Burst strength**	**Begin year**	**End year**
Wang Zhongchang (王忠昌)	11	2.36	2020	2023
Lv Jingquan (吕景泉)	8	—	—	—
Huang Riqiang (黄日强)	8	3.29	1988	2014
Zhang Huibo (张慧波)	7	2.04	2011	2019
Mai Linyan (买琳燕)	7	2.6	2012	2019
Xiao Fengxiang (肖凤翔)	6	2.83	2017	2019
Yang Yan (杨延)	6	2.62	2016	2019
Zhang Lei (张磊)	6	2.96	2021	2023
Hou Song (侯松)	6	—	—	—
Liu Wei (刘伟)	5	2.39	2006	2014
"—": no citation bursts found				

Among these top 10 most productive authors, only 2 authors didn't find citation bursts. Huang Riqiang (黄日) had both the strongest burst strength of 3.29 and the longest influence period, ranging from 1988 to 2014. Wang Zhongchang (王忠昌) (burst strength=2.36) and Zhang Lei (张磊) (burst strength=2.96) contributed 11 articles and 6 articles separately, and most of their works were published in latest three years. Therefore, it is estimated that in the future, there will still be potential scholars making contributions to this field. Other scholars, such as Tian Taotao (田涛涛) (burst strength=2.58, from 2021 to 2023), and Lin Hongmei (林红梅) (burst strength=2.55, from 2020 to 2023), and Wang Lan (王岚) (burst strength=2.13, from 2020 to 2023), even though they didn't appear on Table 1, they were still regarded as the most influential scholars in future, taking their publication volumes, burst strength, and publication year into consideration.

Institution Collaboration Analysis

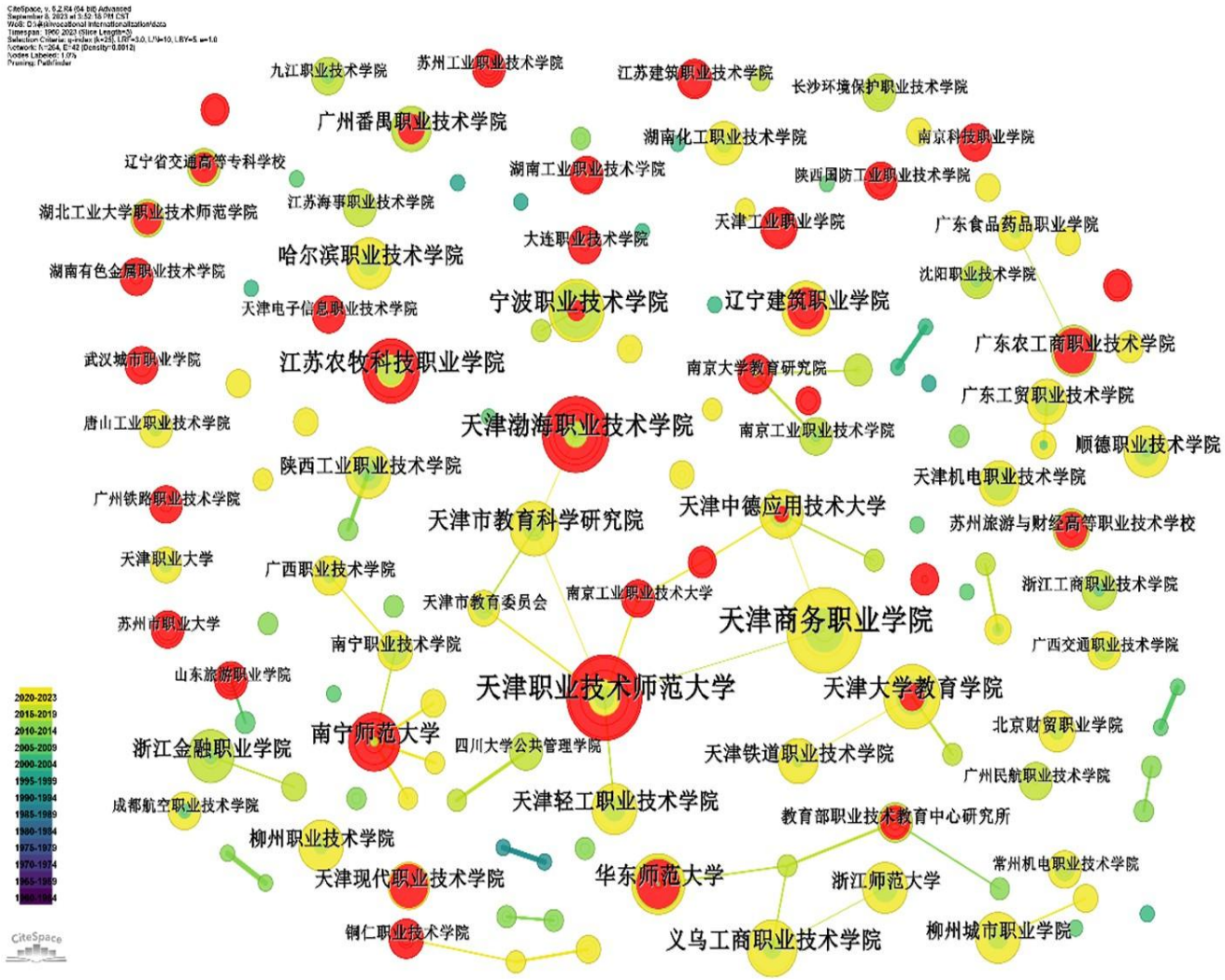

Figure 2. Institution collaboration network

The detailed contribution and collaboration information of institutions in this field is presented in Figure 2. Information on links indicated that cooperation among institutions remained minimal numbers. Of all the institutions, Tianjin University of Technology and Education (天津职业技术师范大学) conducted strong cooperations with Tianjin Light Industry Vocational Technical College (天津轻工职业技术学院), Tianjin College of Commerce (天津商务职业学院), Nanjing Vocational University of Industry Technology (南京工业职业技术大学), Tianjin Academy of Educational Science (天津市教育科学研究院), and Tianjin Municipal Education Commission (天津市教育委员会), showing its strong influence on the contribution of IoVE. Nodes in red color represented institutions with citation bursts, and 41 institutions were detected with citation bursts. The strongest citation burst institutions were Guangdong AIB Polytechnic (广东农工商职业技术学院) with burst strength= 4.12 from 2015 to 2019, followed by Tianjin University of Technology and Education (天津职业技术师范大学) with burst strength=4.09 from 2020 to 2023, and Guangzhou Panyu Polytechnic (广州番禺职业技术学院) with burst strength=3.96 from 2012 to 2014. It is worth mentioning that Nanning Normal University (南宁师范大学), Tianjin Polytechnic College (天津工业职业学院), and Tianjin Bohai Vocational Technology College (天津渤海职业技术学院) were also in the top 10 institutions with the strongest citation bursts list with burst strength of 2.53, 2.46 and 2.35 respectively. Moreover, their citation burst year started from 2020 to 2023, therefore, it is estimated that in the future, these institutions will continue making contributions to IoVE.

According to Price's square root law, the least prolific member of the elite group produces 0.749 times the square root of the number of papers the most prolific member of the elite group produces (Lonsbury and Apple, 2012). The equation is presented as follows:

$m = 0.749\ (n_{max}{}^{1/2})$

Where n_{max} is the largest number of papers contributed by any single author, m is the least number of papers of the elite group.

By using Price's Law, we calculated that elite institutions should produce a minimum of approximately 5 papers, calculated as m= 0.749 ($31^{1/2}$) ≈5. Therefore, 65 institutions with a total of 572 articles were identified as the elite groups. Among these institutions, nine hailed from undergraduate universities, collectively contributing 114 articles. Additionally, three institutions represented scientific research establishments, contributing a total of 27 articles. The remaining 53 institutions were from vocational colleges with 431 articles.

From the perspective of the proportion of these three types of institutions among the total elite groups, vocational colleges topped the list with 81.5%, followed by undergraduate universities with 13.9%, and scientific research institutions only accounted for 4.6%. This proportion further illustrated that the primary frontier of IoVE in China lay within vocational colleges, while undergraduate universities and scientific research institutions served as supplementary contributors, collectively promoting IoVE. Although some undergraduate universities, for instance, Zhejiang Normal University (浙江师范大学), and East China Normal University (华东师范大学), etc., played roles in the study of IoVE, they primarily focused on the development of undergraduate and higher-level education. While other undergraduate universities, such as Tianjin University of Technology and Education (天津职业技术师范大学), and Tianjin Sino-German University of Applied Sciences (天津中德应用技术大学) positioned themselves as striving to become world-class universities in applied technology. Therefore, they mainly focused on the development of vocational education, including IoVE. However, such universities made up only a small minority.

From the geographical distribution of these institutions, it can be observed that the primary regions for the study of IoVE are located in eastern and coastal areas, such as Tianjin, Guangdong, Guangxi, Zhejiang, and Jiangsu provinces, etc. These regions host numerous high-quality vocational colleges, creating favorable conditions for inter-institutional exchange and mutual learning, thus fostering the development of IoVE. Meanwhile, these regions are economically more developed, providing a solid material foundation for IoVE. Furthermore, these areas are located near coastal regions, which leads to deeper and more frequent external openness and cooperation with other countries compared to the central and western regions of China. On one hand, the central and western regions of China lack geographical advantages, resulting in fewer international exchange and cooperation programs. On the other hand, these regions, especially the western regions, lack human and economic resources compared with eastern and coastal areas, which significantly hindered the progress of IoVE. Therefore, more focus on the development of IoVE in the central and western regions is needed.

Co-occurrence Analysis

Keyword Co-occurrence Analysis

Keywords are the core representation of articles and research topics. Burstiness in keywords is characterized by a sudden increase in the number of citations for a term within a certain period. A stronger burst indicates that the research topic is more popular, which could be interpreted as a research frontier during this period (Hou et al., 2018). Therefore, the analysis of keyword co-occurrence and the test of burst keywords can be used to discover the research focus, hotspots, and frontiers of the research in the field of IoVE (Wang and Lu, 2020). Since this study contains both Chinese databases and English databases, the keyword co-occurrence network contains both

English and Chinese keywords (see Figure 3).

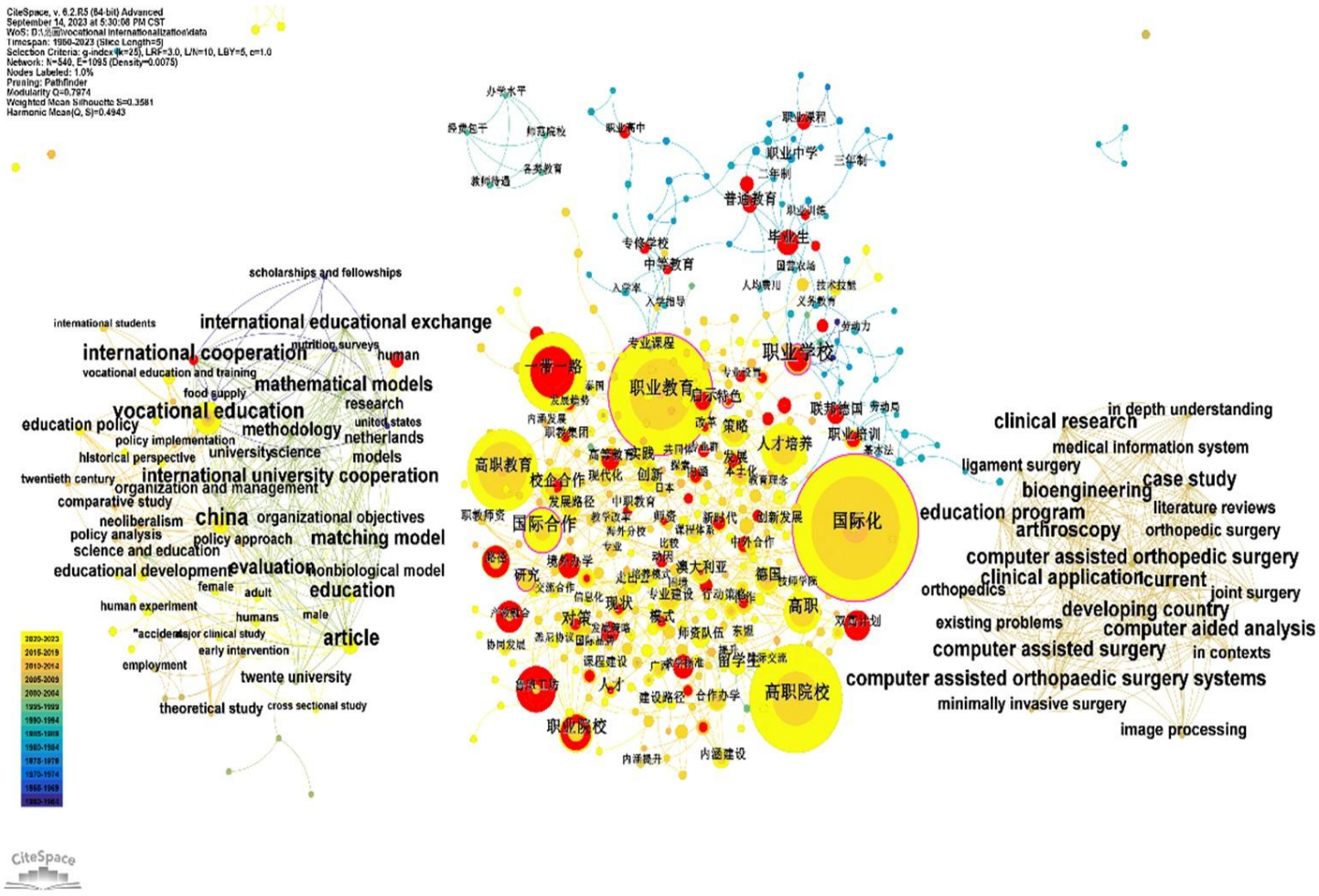

Figure 3. Keyword co-occurrence network

In Figure 3, each node represents one keyword, and the node size represents the frequency of keywords shown in articles over the past 70 years. Nodes with red colors are keywords that contain citation bursts, which will be shown in Figure 4, citation bursts provide a useful means to trace the development of research focus(Chen et al., 2012). Nodes with purple outer rings are keywords that contain high betweenness centrality. Keywords with high betweenness centrality are likely strongly interconnected with other keywords (Pestana et al., 2019). Generally, keywords with betweenness centrality greater than or equal to 0.1 are regarded as heated topics (Chen, 2006). Nodes that possess one of the previous characteristics can be regarded as key nodes. Therefore, to reveal the research focus and hotspots as comprehensively as possible, a summarization of the top 20 keywords from frequency, and betweenness centrality is presented in Table 2.

Table 2. Top 20 keywords with high frequency, and betweenness centrality

Keywords	Frequency	Keywords	Betweenness centrality
国际化	588	职业学校	0.19
职业教育	427	职业教育	0.15
高职院校	334	国际化	0.14

高职教育	234	特色	0.12
一带一路	170	国际合作	0.11
人才培养	92	研究	0.11
国际合作	82	人才	0.1
鲁班工坊	64	职业院校	0.09
高职	55	发展	0.09
校企合作	49	新时代	0.09
对策	44	专业课程	0.09
职业院校	44	对策	0.08
策略	40	毕业生	0.08
路径	40	高职教育	0.07
产教融合	33	高职	0.07
国际交流	32	校企合作	0.07
双高计划	28	高职院校	0.06
师资队伍	26	一带一路	0.06
vocational education	25	启示	0.05
职业学校	22	创新	0.05

The data in Table 2 reveals the diverse spectrum of research focus within the domain of IoVE in China over the past 70 years. This spectrum spans various facets, including the types of vocational schools, international exchange and cooperation, strategies, challenges, teaching staff, the integration of production and education, school-enterprise cooperation, the Belt and Road (B&R), and the Double High-levels Plan, etc. Seven more keywords contained high betweenness centrality. However, out of the keywords with high frequency and high betweenness centrality, only one keyword was in the English language, showing a low contribution of English articles in this field. This phenomenon might be because, on the one hand, most scholars were from China, and may encounter challenges in English writing. Therefore, publishing English articles is difficult for them. On the other hand, due to language barriers, Western scholars who know little Chinese, or know nothing about the Chinese language might find it difficult to read articles written in Chinese, as there is little English literature, or books on vocational education, which makes it impossible for them to conduct research in this field.

From the perspective of keyword content, it is found that over the past 70 years, studies on IoVE have been carried out mainly through higher vocational colleges; the primary methods in this field have included international exchanges and cooperations, school-enterprise cooperation, and the integration of production and

education; the main approach has been to the study of Western vocational educational models, along with analysis and comparisons, while taking into consideration the specific conditions and policies related vocational education in China. This effort aims to explore the sustainable development of IoVE in China and the path of IoVE with Chinese characteristics.

English keywords in Figure 3 show that English language literature studying China's IoVE mainly focus on international exchange and cooperation, policies, study methods, clinical research, education program, organization and management, different types of models, theoretical studies, etc., showing a quite different research focus on IoVE compared with studies conducted by Chinese scholars. Additionally, scholars seem to pay more attention to clinical medicine. However, these nodes are not large, indicating less attention was paid to China's IoVE by Western scholars.

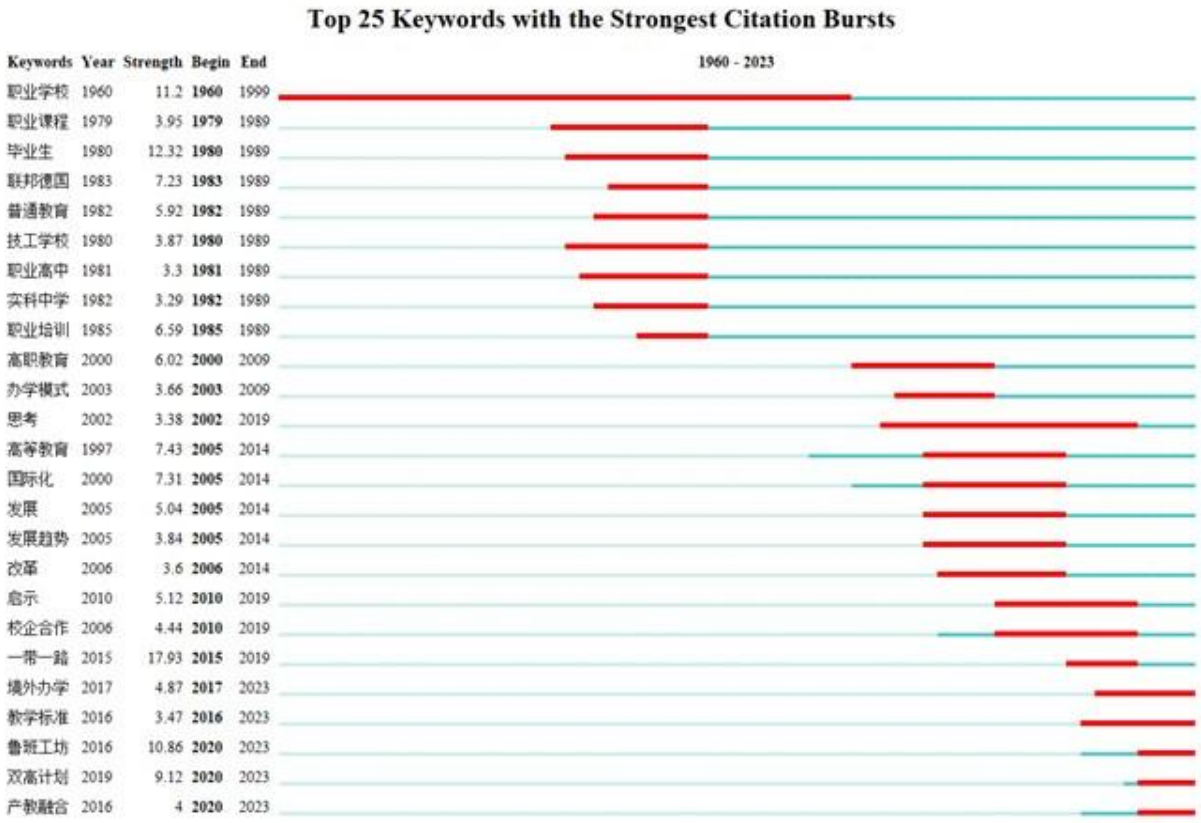

Figure 4. Top 25 keywords with the strongest citation bursts

Sixty keywords were detected with strong citation bursts by CiteSpace. Among them, the top 25 keywords with the strongest citation bursts are presented in Figure 4. It is found that the earliest occurrence of a keyword citation burst was in the year 1960 with the burst keyword "vocational school" (职业学校). Remarkably, this keyword burst for 39 years with a high burst strength of 11.2. Therefore, vocational school emerged as a prominent and trending topic during that period, subsequently driving research into other areas such as vocational courses, graduate students, the Federal Republic of Germany, vocational high school, vocational training, etc. It is interesting to notice that the keyword "internationalization" was first shown in the year 2000 and showed a citation burst in this field five years later in 2005. This illustrates that, despite the longstanding interest in vocational education, the concept of IoVE started very late in China. What should be called for special attention is that keywords like "overseas education" (境外办学), "teaching standards" (教学标准), "Luban Workshop" (鲁班工坊), "Double High-levels Plan" (双高计划), and "industry-education integration" (产教融合) started in recent years and are still active in citation bursts. Since they contained high citation bursts, it is estimated that in the future, studies on IoVE will keep focusing on these fields.

Cluster Analysis

Term Cluster Analysis

Since terms, which are nouns and short phrases, are extracted from titles, abstracts, and keywords of the sample articles, they can, therefore, convey a greater depth of information than keywords, and can be regarded as more precise and reliable indicators of the most popular research topics or themes in a specific field(Zeng and Chini, 2017). Therefore, a cluster analysis of terms (see Figure 5) can reveal the evolution of research topics, hotspots, and directions over time.

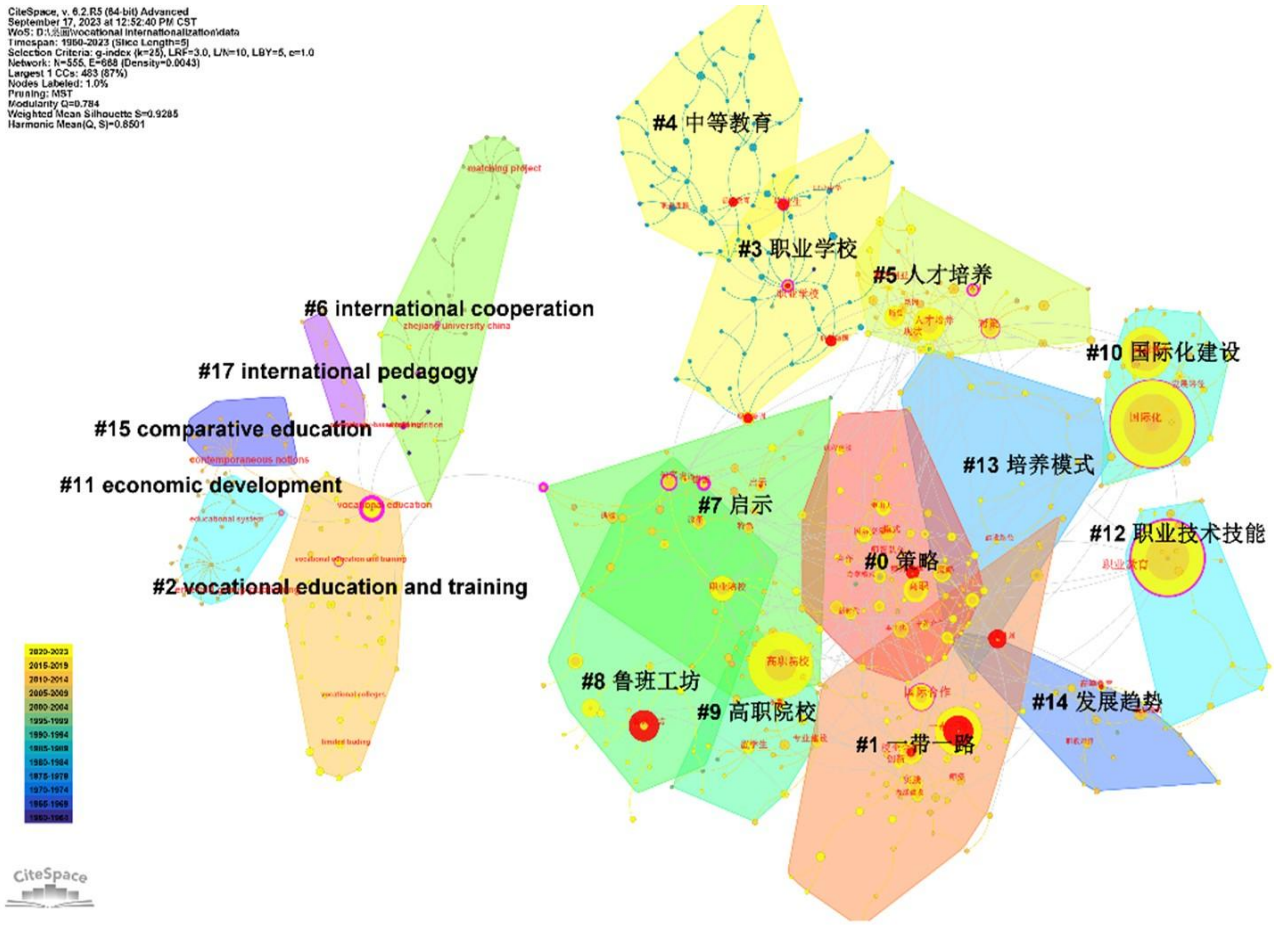

Figure 5. Term cluster network

CiteSpace uses silhouette value (S) to measure whether generated clusters are reasonable. A higher S indicates better homogeneity(M. H. Lim and V. Aryadoust, 2022), if S is higher than 0.5, the cluster is regarded as reasonable(Hou et al., 2018). In the meanwhile, modularity Q is used to measure whether a network is reasonable and reliable. Higher Q indicates higher reliability(Mei Hui Lim and Vahid Aryadoust, 2022), if $0.3<Q<0.7$, it represents that a network can be divided into different relative independent clusters with clear boundaries, if $Q\geq0.7$, it represents the clustering result is highly reliable(Chen et al., 2014; Newman and Girvan, 2004). The term cluster network shown in Figure 5 revealed that Q=0.784, S=0.9285. Therefore, the term cluster network is highly reliable with clear boundaries. However, cluster networks alone can only identify 17 clusters with relevant cluster labels. It cannot provide insight into information behind each cluster, thus being unable to conduct a deeper understanding of how these topics have evolved over 70 years. Therefore, a combination of timeline (Figure 6) and timezone (Figure 7) networks with term clusters can clearly present the specific content, topics, and hotspots of each period, which is helpful for scholars to grasp the development context of this field and further predict the future development trend. Moreover, details of each cluster are presented in Table 3.

Table 3. Detailed information on each cluster

Cluster ID	Size	Silhouette	Mean (Year)	Label (LLR)
#0	51	0.863	2014	策略
#1	47	0.844	2015	一带一路
#2	40	1	2017	vocational education and training
#3	39	0.991	1983	职业学校
#4	37	0.947	1983	中等教育
#5	34	0.903	2012	人才培养
#6	32	0.97	1999	international cooperation
#7	30	0.915	2012	启示
#8	26	0.931	2018	鲁班工坊
#9	25	0.918	2011	高职院校
#10	24	0.827	2013	国际化建设
#11	20	0.992	2006	economic development
#12	19	0.946	2015	职业技术技能
#13	18	0.923	2015	培养模式
#14	17	0.975	2011	发展趋势
#15	16	0.993	2012	comparative education
#17	8	0.997	2013	international pedagogy

According to Table 3, it is found that the largest cluster is Cluster #0 with 51 terms labeled by “strategy” (策略). Further excavation of this cluster found that terms such as “overseas education” (境外办学), “localization” (本土化), “school running patterns” (办学模式), and “cooperation” (合作), etc., were under this cluster. The second-largest cluster is Cluster #1 with 47 terms labeled by “B&R” (一带一路). This cluster mainly focused on the construction of B&R. Therefore, terms such as “countries along the B&R” (沿线国家), “international cooperation” (国际合作), and “innovation” (创新), etc., were under this cluster. The third cluster Cluster #2, which contains 40 terms in total and is labeled by English term “vocational education and training”, indicates that despite relatively few studies written in English language, articles in the English language kept a consistent research topic in this field. Other clusters will be combined accordingly and discussed in the following context.

From the perspective of the mean year that these clusters appeared, it is found that most clusters appeared in the

twenty-first century, especially in the last 20 years. Therefore, it can be concluded that studies on IoVE in China maintained a good upward momentum over the last 20 to 30 years. So, how are the trends of IoVE over the last seven decades? The following content aims to answer this question. By doing so, a comprehensive understanding of studies in this field is hoped to be gained, which can, in turn, provide solid suggestions for the sustainable development of IoVE in China in the future.

Research Development and Evolution Trend Analysis

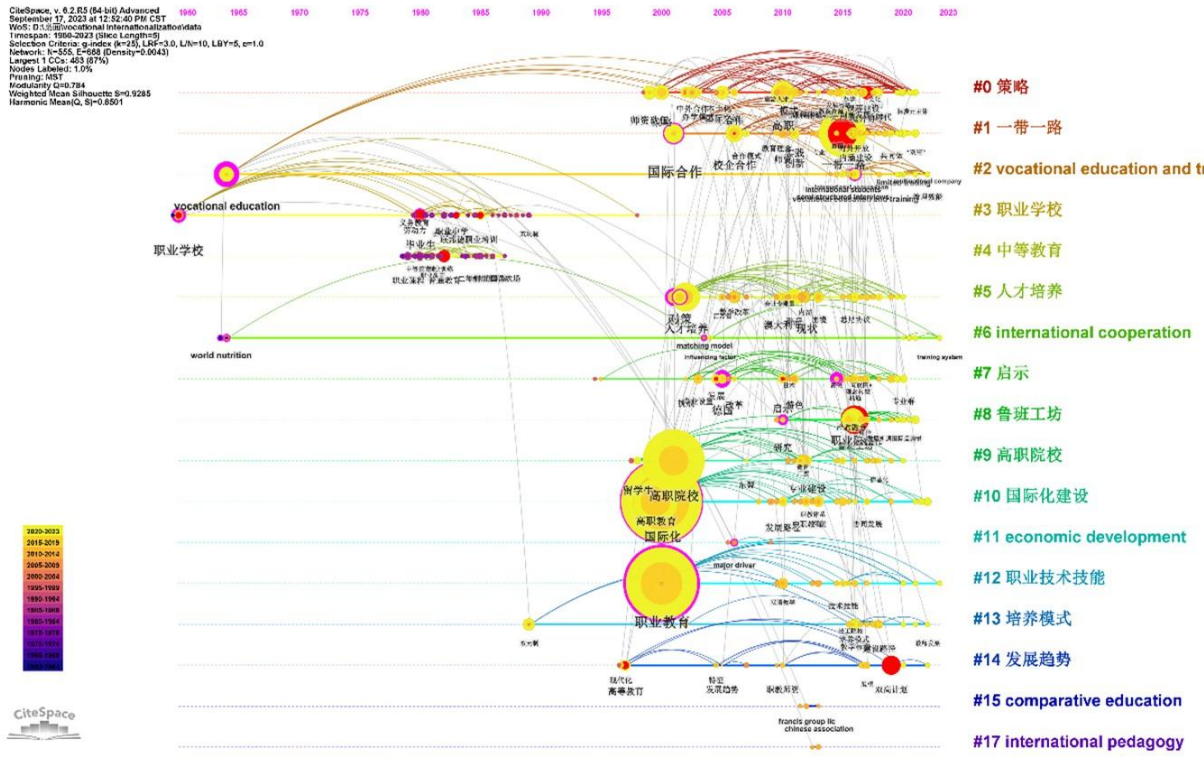

Figure 6. Timeline of terms

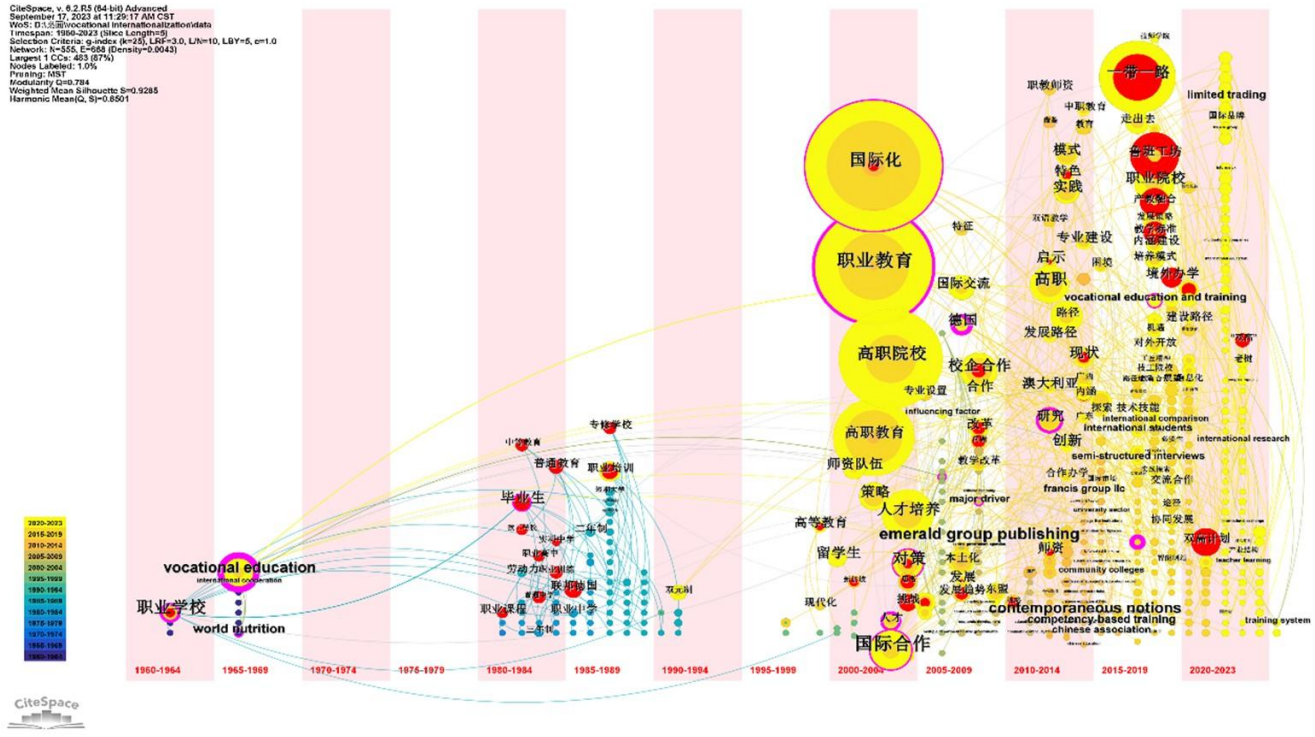

Figure 7. Timezone of terms

To completely review the development process of studies on IoVE in China, Figure 6 and Figure 7 are combined and periods of studies on IoVE in China can be divided into the following five stages.

Stage 1. The emergence and tumultuous development period of vocational education (1949-1979)

According to Figure 7, it is found that the earliest period that terms appeared was between 1960 and 1964. No data were detected from 1949 to 1960. This is because, on the one hand, earlier articles in CNKI didn't contain keywords or abstracts, and CiteSpace cannot detect them. On the other hand, at the beginning of the founding of the People's Republic of China (PR.C), vocational education was regarded as a product of capitalist countries, and China's educational model was mainly inspired and modeled after the Soviet educational model, which didn't include vocational education, moreover, secondary and higher education had already incorporated vocational education (Gao, 1989). Consequently, vocational education was not included in the education system, therefore, no studies were conducted during that period. The concept of vocational education didn't appear in educational policies until 1952. Subsequently, there was development in secondary specialized schools and technical schools, but other aspects of vocational education remained unchanged.

Due to the impact of the Great Lead Forward and the Cultural Revolution, the enthusiasm and stability of vocational education development during this period were severely affected (Liu, 2019). This eventually led to the closure of numerous vocational education schools and a substantial loss of teaching staff, leaving the entire vocational education system in a state of chaos.

Despite this, a series of policies relating to vocational education have been published. Although these policy contents were imperfect, they had established the status of vocational education and ensured safeguards in terms of the number of institutions, types of running school programs, and duration of schooling, thus laying a basic foundation for the future development of vocational education.

Stage 2. The recovery and initial development period of IoVE (1980-1994)

The implementation of China's reform and opening-up policy in 1978 greatly propelled the development of China's economy and society, creating a favorable societal environment for the recovery and development of IoVE in China. During that period, education, especially vocational education had been placed in a position of prioritized development. Through Table 3, Figure 6, and Figure 7, it is found that Cluster #3 and Cluster #4 were included in this period with such keywords as "vocational training" (职业培训), "vocational high school" (职业高中), "The Federal Republic of Germany" (联邦德国), "three-year program" (三年制), "dual-education system" (双元制), "graduates" (毕业生), "apprenticeship training" (学徒培训), "vocational education reform" (职业教育改革), "enterprise management" (企业管理), "schooling form" (办学形式), and "junior college" (短期大学), etc. The total volume of the two clusters reached 76, indicating a relatively great density of studies in this period. All in all, the main focuses during this period can be summarized into three aspects as follows:

First, a focus on German vocational education. Impacted by the Cultural Revolution, all aspects of China had been profoundly affected and experienced upheaval. The reform and opening-up, with economic development as its central focus, gradually pulled China out of the 'shadow', leading to the gradual recovery of various aspects. Economic development required a significant number of applied and technical professionals, which aligned with the talent development model of vocational education. Consequently, vocational education during this period was placed in a position of prioritized development. However, initially, China borrowed from the Soviet model, which didn't include a vocational education component. As a result, vocational education in the initial period of reform and opening-up was not well-developed in terms of institutional infrastructure, talent development, curriculum design, and other aspects. In contrast, Germany was successful in vocational education, attracting a great many scholars to research German vocational education, resulting in great changes in China's

vocational education including the introduction of training models such as the dual-education system, dual-track system, etc.; the adoption of running school models, such as the two-year and three-year programs, specialized schools, etc.

Second, a gradually established vocational education system with a Chinese model. From the perspective of terms, it is found that during this period, vocational education in China only studied from other countries, but also concentrated on the construction of its own systems. Terms such as schooling models and levels, teaching methods of vocational education, as well as systems of vocational education, etc., were shown in Figure 6 and Figure 7, indicating concerns about the establishment of vocational education systems.

Third, a gradual focus on higher vocational education. Previous studies mainly focused on secondary vocational education, this is because the concept of higher vocational education wasn't introduced in China until the establishment of Jinling Vocational University in 1980. The "*Decision of the Central Committee of the Communist Party of China on Educational System Reform*" ("Decision") issued in 1985, put forward the need to restructure secondary education and strongly promote higher vocational and technical education. moreover, the "Decision" also proposed the gradual establishment of a vocational education system that spans from primary to higher levels, is industry-aligned, and has a coherent structure that can interact with general education (MOE, 1985).

Since then, the development direction, tasks, and roles of vocational education in China have become clear. During this period, China not only established a dual-track education system, combining secondary vocational education with general secondary education but also gradually solidified higher vocational education.

Stage 3. The speed-up period of IoVE (1995-2005)

Figure 7 shows that since 1994, studies on IoVE have gradually increased, and have remained a noticeable upward trend. According to the node size shown in Figure 7 and the distribution of these nodes in Figure 6, it is found that Cluster #0, Cluster #5, Cluster #9, and Cluster #12 first appeared during this period. The number of clusters indicates wide research topics during this period, especially after the year 2000 when research in this field experienced an explosive surge. Terms in these clusters cover wide aspects ranging from international communication, localization, sino-foreign cooperation, and globalization to talent cultivation, strategies, international students, and teaching staff. The term internationalization (国际化) appeared in this period, indicating that previous studies relating to internationalization were shown in different forms with different terms. Contents from these clusters suggested that during this period, IoVE mainly focused on cooperating and communicating with enterprises, international organizations, universities, etc. Meanwhile, focus was also placed on the localization construction of vocational education, and strategies to enhance the international level of staff and students, as well as students' ability to handle challenges while being put into the international market. Further, policies issued during this period also stimulated the fast development of IoVE. For instance, the Vocational Education Law of the People's Republic of China, enacted in 1996, stipulates the encouragement of foreign organizations and individuals to provide financial support and donations for vocational education. The Decision on Promoting the Reform and Development of Vocational Education, issued in 2002, and the Regulations on Sino-Foreign Cooperative Education of the People's Republic of China, promulgated in 2003 provided strong policy support for the international development of vocational education, especially in areas such as hosting international programs in China and establishing overseas vocational education initiatives.

Stage 4. The connotative development period of IoVE (2006-2013)

The series of policy documents, including the "Several Opinions in Enhancing the Quality of Higher Vocational Education" issued by the Ministry of Education in 2006, marked a significant milestone in strengthening the

international development and quality of vocational education in China. This signaled the commencement of a phase where vocational education in China started to focus on its intrinsic development.

Although Cluster #5, and Cluster #9 first appeared during the last period, the mean year of the two clusters was in 2012 and 2011 separately. Therefore, the essential development of these two clusters happened in this period. Moreover, according to the mean year of clusters, it is found that Cluster #7, Cluster #10, Cluster 14, Cluster 15, and Cluster 17 were all in this period. The appearance of clusters in this period indicated that studies on IoVE in China entered into a new stage that focused on the quality and connotation of IoVE instead of just on the quantity of IoVE. Detailed information on these clusters suggested that during this period, wide and diverse perspectives on IoVE were conducted.

Talent cultivation, implications of IoVE from other countries, the construction of internationalization, and the development trends of IoVE, as well as comparative studies were all hot topics among scholars. In terms of talent cultivation, some scholars analyzed existing problems of cultivating talents and put forward that strategic innovations are needed to guarantee talents meet international standards (Li, 2013). Others conducted studies from the perspective of talent cultivation models (Fang, 2015; Liu et al., 2012), suggesting that the talent cultivation model should be based on principles of borrow and innovation and form a unique model under certain content. Implications and comparative study of IoVE mainly focused on other countries' or regions' experiences (Peng, 2011), challenges (Li and Shi, 2006), and specialties and advantages (Duan, 2012; Xu et al., 2012), etc. All these indicated the in-depth studies on IoVE instead of just the explanation of internationalization or just borrowing from other countries.

Stage 5. The transition and upgrading period of IoVE (2014-present)

The Belt and Road (B&R) initiatives brought IoVE in China new definitions, tasks, and concepts. B&R has served as a strategic blueprint for IoVE in China. Strengthening exchanges and cooperation with countries along the B&R is not only an important measure to explore the development model of vocational education with Chinese characteristics, and provide a Chinese solution for vocational education worldwide but also an inherent requirement for the high-quality development of vocational education in China (Cai and Zhang, 2023). Moreover, the profound, all-encompassing, and diverse manifestations of international education have gradually become distinctive benchmarks in the pursuit of establishing world-class vocational colleges (Xu and Huang, 2016).

According to Figure 7, it is found that though small in node size during this period, nodes were in a large number. The mean year of clusters suggested that during this period, studies focused on Cluster #0 strategy, Cluster #1 B&R, Cluster 2 vocational education and training, Cluster #8 Luban Workshop, Cluster #12 vocational and technical skills, and Cluster #13 cultivating mode. The deepening of B&R has broadened China's cooperation and communication with other countries alongside the B&R. A great many high-level technical skills with international visions and rules are needed to participate in the construction of B&R (Wang et al., 2020), great chances also go to the cooperation between schools and enterprises, "going out" with enterprises becomes an important mission for vocational schools. However, during the process of "going out", vocational schools also face challenges and integration of different geographical, ethnic, technological, and cultural factors (Wang and Wang, 2017). Moreover, unbalanced development, the stagnation of cooperation mechanisms, uncoordinated talent training, and imperfect policies impeded the development of IoVE (Guo, 2019; Zhang and Yang, 2021). Under such conditions, upgrading and transition of vocational education are needed to meet deeper cooperation and mutual benefits among countries.

This period is regarded as the golden era of vocational education reform and development(Daily, 2018). A series of policies have been issued to provide policy support for the deeper, qualified, and sustainable development of

IoVE. For instance, *Opinions on Promoting the High-Quality Development of Modern Vocational Education* issued in 2021, clearly specified that vocational schools should actively follow enterprises in their global expansion efforts, and proactively establish a group of high-level international vocational schools. A year later in 2022, another policy *Opinions on Deepening the Reform of the Modern Vocational Education System* further emphasized the need to build international brands in vocational education, with a focus on serving international capacity cooperation and nurturing internally competent talents required by Chinese enterprises going global, aiming to enhance the international influence of Chinese vocational education. Consequently, besides B&R, other top-level designs, such as the Luban Workshop, Double High-levels Plan, and 1+X Certificate System, etc., all signify China's determination to establish a group of high-level vocational colleges and core professional clusters. These endeavors aim to spearhead reforms, foster sustainable development, and establish educational institutions and programs that blend Chinese characteristics with international excellence (Daily, 2019; News, 2019). With all these efforts, China's IoVE has gradually shifted from localization to "going out".

CONCLUSION

This study utilizes scientometric methods to analyze the 70-year trajectory of China's vocational education internationalization (IoVE), uncovering its research landscape, collaborative dynamics, and evolutionary phases. By integrating theoretical frameworks such as Knight's (2003) model of educational internationalization and the competency-based education theory, the research situates IoVE as a pivotal mechanism for both domestic skill development and global education governance, addressing earlier conceptual ambiguities.

The results show that IoVE is a hot topic in China but cooperation deficiencies among scholars and institutions. Though wide in research topics, IoVE has not fully played its role in the development of rural revitalization, which can be seen from the keywords co-occurrence analysis. Vocational education, instead of IoVE is more related to rural revitalization. The upgrading and transition of IoVE guarantee the comprehensive, coordinative, and sustainable development of IoVE, which can further ensure sustained, harmonious, and stable economic and social development (XIE, 2019).

From author collaboration analysis, this study answered Q1 and found that most scholars didn't conduct in-depth cooperations and they worked individually. Though there were several relatively stable cooperative teams, most were from the same institution. Cross-unit cooperation accounted for only a small proportion. There are also a great many high-productivity and high-impact scholars, represented by Wang Zhongchang, Huang Riqiang, Zhang Lei, Tian Taotao, and Lin Hongmei, etc. They are believed to keep making contributions in this field in the future.

From institution collaboration analysis, this study answered Q2 and concluded that IoVE is highly paid attention to by institutions in China. However, cooperation among institutions remained minimal numbers, which was consistent with author collaboration. Despite that, this study found that the most attention that institutions paid to this field is from vocational colleges, followed by undergraduate universities and scientific research institutions. Institutions from eastern and coastal areas of China paid much more attention than those from the central and western regions of China.

From keyword co-occurrence analysis, Q3 is answered. It is found that over the past 70 years, research hot topics have kept emerging and varying. Differences in research topics also exist between Chinese scholars and Western scholars. Chinese scholars focused widely ranging from school types, strategies, challenges, and policies to staff, school-enterprise cooperation, production-education integration, etc. However, due to language barriers, Western scholars contributed a small number of studies on China's IoVE and mainly focused on study methods, clinical research, vocational education models, and organization and management. They are more interested in clinical medicine. The highly discussed topics are overseas education, teaching standards, Luban Workshop,

Double High-levels Plan, and industry-education integration, etc., and they are believed to be the hot topics in the future.

From term cluster analysis, we concluded 16 clusters, indicating that over the past 70 years, studies on IoVE mainly focused on 16 areas. The combination of term cluster, timeline and timezone of terms helped to answer Q4. The development and evolution of IoVE over the past 70 years has been a journey marked by five stages, starting from a turbulent period, transitioning into a phase of recovery and initial development, followed by speed-up, then connotative development, and finally evolving into the current period of transformation and upgrading.

Drawing from the study's findings on collaborative fragmentation, regional disparities, and thematic gaps in IoVE, targeted policy actions are essential. First, address the low cross-institutional collaboration by incentivizing interdisciplinary partnerships—e.g., establishing "IoVE Research Alliances" to connect vocational colleges, universities, and enterprises for joint projects on global skill standards and sustainable development. Second, tackle regional imbalances where eastern institutions lead due to policy support (such as "Double High-levels Plan") by channeling funding to midwestern "Belt and Road Skills Centers" and fostering east-west partnerships to share expertise in overseas initiatives like Luban Workshop. Third, bridge the disconnect between IoVE and rural revitalization by integrating rural skill programs (e.g., agricultural technology, rural e-commerce) into international projects, such as launching "Rural Luban Workshops" to align with global poverty reduction goals (SDG 1). These measures, grounded in the study's empirical evidence, aim to enhance collaboration, equity, and practical impact, ensuring IoVE evolves as a cohesive strategy for both national development and global educational equity.

Limitations

Despite previous conclusions, there are still some limitations in this study. Firstly, this study only used four databases to sort out articles, articles relevant to IoVE published in other databases can not be analyzed. Secondly, the English search string only contains vocational education and international*, other articles with different topics but relevant to internationalization (for instance, overseas education) can not be detected. Thirdly, this article only detected articles written in English and Chinese, those written in other languages were neglected, which caused limited results. Lastly, this article only analyzed journal articles, the meeting summary, reviews, news reports, books, book chapters, etc., are excluded, which may result in some important views and hot spots not being present in the analysis.

Suggestions

To address the identified challenges and leverage the study's findings, four key policy recommendations are proposed. First, shift societal perceptions of vocational education to overcome long-standing biases that relegate it to a secondary status compared to general education. Despite policy advancements—such as the 2019 National Vocational Education Reform Plan, which explicitly states the equal importance of vocational and general education—deep-rooted mindsets viewing vocational education as lower-quality hinder its integration with rural revitalization and global initiatives. Public campaigns, media engagement, and policy advocacy can promote recognition of vocational education's role in both domestic skill development and international cooperation, creating a supportive environment for IoVE expansion.

Second, strengthen multilevel collaboration among scholars, institutions, and enterprises to address the fragmentation in research and practice. Vocational education's practical focus demands partnerships that bridge academic theories with industry needs. Institutions should establish resource-sharing frameworks (e.g., joint international programs, faculty exchanges) to enhance cross-regional and cross-disciplinary cooperation, while

enterprises should be incentivized to co-design curricula, develop apprenticeship models, and fund international projects. For example, creating vocational education internationalization alliances could foster regional networks, pooling resources to address shared challenges and amplify collective impact.

Third, optimize regional resource allocation to redress disparities in IoVE development. Eastern coastal regions, buoyed by economic openness and policy support (e.g., the "Double High-levels Plan"), dominate IoVE initiatives, while central and western areas lag due to limited funding and international exposure. Targeted policies, such as earmarking government grants for midwestern institutions to develop overseas projects (e.g., Luban Workshop expansions) or fostering east-west institutional partnerships, can build capacity in underserved regions. Aligning IoVE with national strategies like the "Western Development Program" would ensure balanced growth and leverage local strengths for international collaboration.

Fourth, increase funding and diversify financing mechanisms to secure IoVE's sustainability. Current investment in vocational education—accounting for just 20% of higher education budgets despite 55% enrollment—lags behind its strategic importance (Zhang et al., 2022). Governments should prioritize budget allocations for internationalization initiatives, while also encouraging private-sector participation. Mechanisms like tax incentives for corporate contributions or international funding pools can diversify revenue streams, enabling institutions to enhance infrastructure, faculty training, and overseas program development. These measures are critical to elevating IoVE's global influence and ensuring its long-term viability.

Ethical Approval: This study constitutes a secondary literature analysis utilizing exclusively publicly available academic database records, involving no human subjects or private data, thus requiring no ethics committee approval.

Conflict of Interest: The authors declare they have no financial interests.

Data Availability: The datasets generated during and/or analyzed during the current study are not publicly available due to the confidentiality of the respondents' information but are available from the corresponding author upon reasonable request.

REFERENCE

1. Cai, J., Zhu, Z., and Xiong, J., Visualization Analysis of China's Higher Education Internationalization Research over the Past 70 Years Forum on Contemporary Education,no. 02, 2020, pp. 14-30.
2. Cai, Y., and Zhang, L., On the Transition Direction, Model and Paths of Vocational Education Internationalization in China -- Taking Luban Workshop as an Example. Vocational and Technical Education, vol. 44, no. 16, 2023, pp. 61-67.
3. Chen, C., CiteSpace II: Detecting and visualizing emerging trends and transient patterns in scientific literature. Journal of the American Society for information Science and Technology, vol. 57, no. 3, 2006, pp. 359-377.
4. Chen, C., Dubin, R., and Kim, M. C., Emerging trends and new developments in regenerative medicine: a scientometric update (2000–2014). Expert opinion on biological therapy, vol. 14, no. 9, 2014, pp. 1295-1317.
5. Chen, C., Hu, Z., Liu, S., and Tseng, H., Emerging trends in regenerative medicine: a scientometric analysis in CiteSpace. Expert opinion on biological therapy, vol. 12, no. 5, 2012, pp. 593-608. https://doi.org/https://doi.org/10.1517/14712598.2012.674507
6. Council, S. (2021). Poverty Alleviation: China's Experience and Contribution. China: Foreign Languages Press Retrieved from http://english.www.gov.cn/archive/whitepaper/202104/06/content_WS606bc77ec6d0719374afc1b9.html

7. Daily, C. E. (2018). China's vocational education development has entered a golden period.
8. Daily, C. E. (2019). Strengthening the leadership of the Party in the construction of the 'Double High-levels Plan".
9. Duan, W., A comparative study of the internationalization of vocational education in the United States and Japan. Vocational Education Research,no. 03, 2012, pp. 177-179.
10. Fang, M., An Empirical studies on the Talent Training Mode of International Hotel Management ion Higher Vocational Education--A Case Study of Tourism College of Zhejiang China. Journal of Jilin Engineering Normal University, vol. 31, no. 03, 2015, pp. 82-84.
11. Gao, Q., Forty Years of Vocational Education in China. Education and Vocation,no. 09, 1989, pp. 6-9.
12. Guo, B., Xu, J., and Shen, J., Research on the Internationalization of Undergraduate Education and Higher Vocational Education in China in Recent Ten Years. Journal of Liaoning Higher Vocational, vol. 21, no. 02, 2019, pp. 10-15.
13. Guo, J., Research review of "One Belt And One Road" in vocational education service. Chinese Vocational and Technical Education,no. 12, 2019, pp. 24-29.
14. Hou, J., Yang, X., and Chen, C., Emerging trends and new developments in information science: A document co-citation analysis (2009–2016). Scientometrics, vol. 115, no. 2018, pp. 869-892. https://doi.org/https://doi.org/10.1007/s11192-018-2695-9
15. Knight, J., Internationalization: management strategies and issues. International education magazine, vol. 9, no. 6, 1993, pp. 21-22.
16. Lei, M., Wang, P., and Liu, X., Empowering: The Fundamental of Educational Poverty Alleviation - The Path to Poverty Eradication in China. Journal of Capital Normal University(Social Sciences Edition),no. S1, 2022, pp. 7-21.
17. Li, C., and Shi, Y., Russian Higher Education System's Reform & Challenges--In the Framework of Bologna Process. Fudan Education Forum,no. 02, 2006, pp. 66-71.
18. Li, F., Historical Evolution of Internationalization of China' Higher Vocational Education and Innovations in Talent Cultivation. Journal of Vocational Education,no. 22, 2013, pp. 34-37.
19. Li, J., and Pilz, M., International transfer of vocational education and training: A literature review. Journal of Vocational Education and Training, vol. 75, no. 2, 2023, pp. 185-218. https://doi.org/10.1080/13636820.2020.1847566
20. Liang, J., and Shi, W., A visual Analysis on the Hot Topic of the Internationalization of Vocational Education in the Past 40 Years of Reform and Opening-up. Contemporary Vocational Education,no. 06, 2018, pp. 18-24. https://doi.org/10.16851/j.cnki.51-1728/g4.2018.06.001
21. Lim, M. H., and Aryadoust, V., A scientometric review of research trends in computer-assisted language learning (1977-2020) [Review]. Computer Assisted Language Learning, vol. 35, no. 9, 2022, pp. 2675-2700. https://doi.org/https://doi.org/10.1080/09588221.2021.1892768
22. Lim, M. H., and Aryadoust, V., A scientometric review of research trends in computer-assisted language learning (1977–2020). Computer Assisted Language Learning, vol. 35, no. 9, 2022, pp. 2675-2700.
23. Liu, W., Retrospect and Prospect of China's Vocational Education Development in the 70 Years since the Foundingof New China. Inner Mongolia Social Sciences, vol. 40, no. 02, 2019, pp. 192-197. https://www.cnki.com.cn/Article/CJFDTotal-NMGR201902028.htm
24. Liu, Y., Xu, X., and Guo, J., The Internationalization Reform of Talent Cultivation Models in Higher Vocational Tourism Majors. China Metallurgical Education,no. 03, 2012, pp. 4-6. https://doi.org/10.16312/j.cnki.cn11-3775/g4.2012.03.003
25. Liu, Z., Chen, Y., and Hou, H. (2008). Scientific Knowledge Graph Methods and Applications. People's Publising House.
26. Lonsbury, J., and Apple, M. W., Understanding the limits and possibilities of school reform. Educational Policy, vol. 26, no. 5, 2012, pp. 759-773. https://doi.org/10.1177/0895904811425909

27. Mo, Y., Internationalization of Higher Education in China: Stage Characteristics, Influence Factors and Reform Measures. Vocational and Technical Education, vol. 40, no. 04, 2019, pp. 13-17.
28. MOE(1985). Decision of the Central Committee of the Communist Party of China on Educational System Reform. https://www.edu.cn/zhong_guo_jiao_yu/zheng_ce_gs_gui/zheng_ce_wen_jian/zong_he/201007/t20100719_497960.shtml
29. Newman, M. E., and Girvan, M., Finding and evaluating community structure in networks. Physical Review E, vol. 69, no. 2, 2004, pp. 1-15.
30. News, C. (2019). "1+X Certificate System": An institutional design related to talent cultivation and evaluation models.
31. Peng, X., German Education Reform and Its Enlightenment. Journal of Jiujiang Vocational and Technical College,no. 01, 2011, pp. 1-3+6.
32. Pestana, M. H., Sánchez, A. V., and Moutinho, L., The network science approach in determining the intellectual structure, emerging trends and future research opportunities–An application to senior tourism research. Tourism Management Perspectives, vol. 31, no. 2019, pp. 370-382. https://doi.org/https://doi.org/10.1016/j.tmp.2019.07.006
33. Wang, W., and Lu, C., Visualization analysis of big data research based on Citespace. Soft Computing, vol. 24, no. 2020, pp. 8173-8186. https://doi.org/https://doi.org/10.1007/s00500-019-04384-7
34. Wang, Y., and Wang, Z., Multi-dimension Study on Vocational Schools "Going Out" with Enterprises from the Perspective of the "Belt and Road" Strategy. Vocational and Technical Education, vol. 38, no. 16, 2017, pp. 19-23.
35. Wang, Z., On Changes and Prospects of China's Vocational Education Internationalization Policy in Past 40 Yeats of Reform and Opening-up --Based on Analysis of 42 Country-level Policy Texts. Vocational and Technical Education, vol. 39, no. 21, 2018, pp. 15-21.
36. Wang, Z., Dong, L., and Li, X., Co-construction of the Belt and Road: Exploration of School-enterprise Collaboration International Education in the New Era. Education and Vocation,no. 21, 2020, pp. 28-35. https://doi.org/10.13615/j.cnki.1004-3985.2020.21.004
37. XIE, L., AReview of Academic History of Sustainable Development of Vocational Education in the 70th Anniversary of the Founding of the People's Republic of China. Higher Vocational Education Exploration, vol. 18, no. 04, 2019, pp. 37-47.
38. Xu, H., and Huang, H., Research on the Internationalization Path of Higher Vocational Education in the Context of the 'Belt and Road' Strategy. Jiangsu Higher Education,no. 04, 2016, pp. 143-145. https://doi.org/10.13236/j.cnki.jshe.2016.04.039
39. Xu, H., Li, W., and Hsiu, C. W., The Internationalization Features and Implications of Higher Vocational Education: A Case Study of the Sino-British Vocational Education Cooperation Project at Inner Mongolia Business and Trade Vocational College. China Adult Education,no. 15, 2012, pp. 74-77.
40. Yang, H., and Xiao, Y., Research on the Internationalization Development of Higher Vocational Education under the Background of "One Belt and One Road". Journal of Vocational Education,no. 10, 2019, pp. 40-45.
41. Yang, J., Logical Thinking and Practical approach of International Talent Training in China's Vocational Education under the "Belt and Road" Initiative. Jiangsu Higher Education,no. 05, 2023, pp. 120-124. https://doi.org/10.13236/j.cnki.jshe.2023.05.017
42. Yuan, L., and Chen, Y., Analysis on Internationalization of Vocational Education and Training in European Union. Vocational and Technical Education, vol. 40, no. 03, 2019, pp. 56-61.
43. Zeng, R., and Chini, A., A review of research on embodied energy of buildings using bibliometric analysis. Energy and Buildings, vol. 155, no. 2017, pp. 172-184. https://doi.org/https://doi.org/10.1016/j.enbuild.2017.09.025

44. Zhang, L., Qiu, Y., He, Z., and Yang, Y., The logical connotation and practical path of constructing the new pattern of international exchange and cooperation in vocational education. Chinese Vocational and Technical Education,no. 22, 2022, pp. 5-11+46.
45. Zhang, Q., and Yang, M., Problem Representations and Promotion Strategies of China-ASEAN Vocational Education Cooperation from the Perspective of the Belt and Road Initiative. Education and Vocation,no. 07, 2021, pp. 12-18. https://doi.org/10.13615/j.cnki.1004-3985.2021.07.002