Knowledge Graph of International Educational Administration Research in the Last Decade: A Literature Review Based on CiteSpace

Zhongyi Xiao[1]

Abstract

The development of educational administration has gone through several centuries. Currently, the discipline has become an important branch of the field of pedagogy. In order to reflect the existing research achievements in the international field educational administration comprehensively, systematically, and objectively, the author makes full use of CiteSpace to visualize the research outcomes within the domain combined with qualitative analyses of 500 journal articles with high citations in core collection database of the Web of Science. The results indicate that the aggregate issue of papers published in topic concerned journals is on the rise; most of the authors are independent writers, while research institutions are proved to be more inclined to collaborate; the researches focus on democratic governance, performance, participation, leadership, educational policy, public sector, value creation, rights, diversity, and higher education indicating the desirable prospect of the theoretical development in the realm of educational administration.

Keywords: *international educational administration; literature review; knowledge graph; CiteSpace*

Introduction

Currently, the academia has not yet agreed on the origin of of the discipline educational administration, but what can be confirmed is the rise of educational management in the 19th century in Europe. Although there is no introduction to Stein in authoritative reference books such as the *The International Encyclopedia of Education·Educational Administration*, edited by renowned educators T. Husen and T. N. Postlethwaite, it is assured that Stein's discourse on the relationship between state power and education in the 19th century has already been a small episode in the history of educational administration albeit its unpopularity(Yang, 2002). However, Since the late 19th century various favorable national policies make possible frequent international cooperation. As one of the branches of pedagogy, educational administration has attracted the attention of domestic and foreign scholars although it is still in the early stages of development. China as the largest developing country spares no effort to strengthen the international research with its own Chinese distinctiveness. As such, the country has   accumulated profound theoretical knowledge of the territory.

For further facilitate the development of the subject domestically, researchers in the field are required to catch up the latest trend of the international research. Therefore, This study aims, firstly to explore the achievements of foreign journal papers on the topic of educational administration in the past

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[1] Southeast University, Jiangsu Province, China. Email: 1076613527@qq.com

decade, secondly to analyze the articles which have had a significant impact on this field, thirdly to discover research hotspots and trends in educational administration, and fourthly to point out the aspects calling for improvement and lastly to propose the direction of the future research?

Methods

This article is based on the core collection of Web of Science for retrieval, and the data mainly includes the title, author, abstract, and reference of each literature. The data was collected on May 17, 2023, and the search time span was from 2012 to 2022. Since there have always been different expressions such as management, governance and administration in the academia, the author retrieved the samples by typing the three words in the theme column. In total, 562 articles were obtained by weeding out conference papers, online materials, literature reviews, and book reviews, and non-English papers. And only 500 pieces of works were retained based on their clear correlation with the topic. Finally, CitSpace6.2 was used for visualized analyses. It is confirmed that the articles of high citations published in international journals typically have a significant impact on educational administration researches globally. Although there are other high-quality journal papers with higher citations before 2012, to grasp the current developments and research hotspots in the field, selecting literature for visualization from the latest decade is more helpful for scholars to promote their future researches, analyzing the reasons behind the phenomenon and proposing effective solutions.

General Information of the Samples

1.Distribution of the Articles by Year

The number of international researches on educational administration from 2012 to 2022 is demonstrated in Figure 1. Although the emergence of various theories can be traced back to the 20th century (Zhang, 2003), it is interesting to note that the number of papers on educational administration was still not high in the first five years (2012-2017), particularly in the first two years 2012 and 2013. As researchers and research institutions deepened their studies on the discipline in the new era, the sphere has entered a period of rapid development (2017-2019). In the next three years, the number of international literature fluctuated, but the overall number remained high and reached its peak in 2022, indicating its relatively stable development.
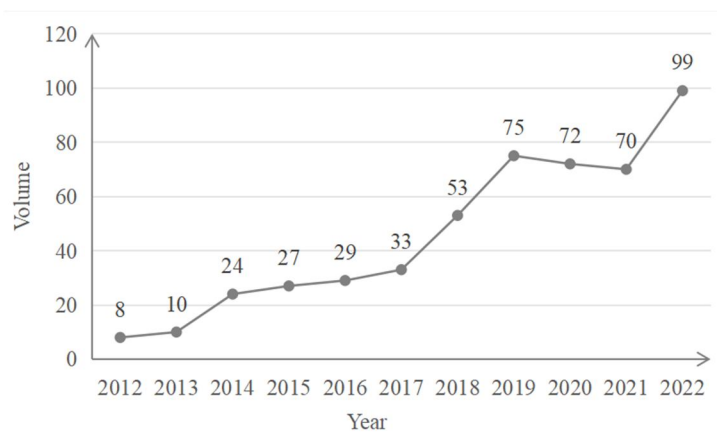

Figure 1. Number of the samples btween 2012-2022

2.Authors and Institutions

The collaborative network of authors generated by CiteSpace clearly demonstrates the influential scholars and their collaborations. The parameters in the upper left corner of Figure 2 exhibit a total of 278 nodes and 117 connections in the figure, with a network density of 0.003. The node size corresponds to the number of articles published by the authors, and the linking lines indicate a cooperative relationship between them. The color indicates the first time they collaborate. However, there are a large number of independent authors scattered around the core authors and the core team, which means they are immersed in their own work and do not seek cooperation that may well maximize their achievements. Generally speaking, the research force is scattered. The data shows that since 2012 a few most productive authors have been Ford Michael R (5 pieces), Mcbeth Bowen (3 pieces), George Bert (3 pieces), and Chung Hsi Mei (3 pieces). Among the remaining 275 authors, a total of 21 have published 2 articles. But from the perspective of time Noordegraaf Mirko, Valenti M Alix and Gong Ting are the first to conduct researches in the domain, but the number of works is only one respectively.

Figure 2 Collaborative network of authors

The collaborative network of institutions drawn by CiteSpace is used to discover the key institutions and their contributions in the sphere of international educational administration. According to the parameters in the upper left corner of Diagram 2, it can be seen that there are a total of 257 nodes and 231 connections in the diagram, with a network density of 0.007. The node size corresponds to the number of outputs from institutions, and the linking lines indicate a cooperative relationship between the organizations. The main force stems from universities and research institutes, and the cooperation between institutions is relatively close than those between individual authors. The dense networks in the upper left and lower right parts of Figure 3 represent a huge cooperation network with Chinese

institutions and British ones as the centers respectively. This diagram to some extent shows the institutions that have played a key role in international education management research in the past decade.
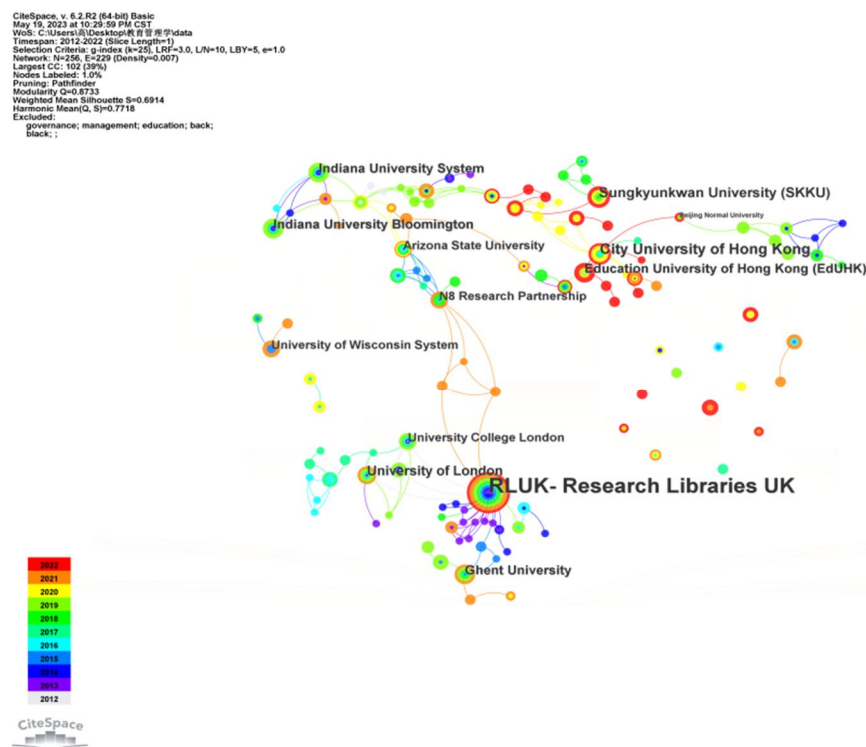

Figure 3 Collaborative network of institutions

From the perspective of publication volume, as shown in Chart 2, as of 2022, the larger research teams include the Research Libraries UK (35 pieces), City University of Hong Kong(11 pieces), Sungkyunkwan University (9 pieces), University of London(8 pieces), Hong Kong University of Education (7 pieces), Indiana University Bloomington (7 pieces), Ghent University (7 pieces). It is worth noting that the performance of research libraries in the UK is so outstanding that even City University of Hong Kong, which closely follows in terms of literature volume, finds it hard to catch up the libraries. As regard to the collaboration, the performance of the Research Libraries UK, City University of Hong Kong, and Hong Kong University of Education are impressive. Overall, the cooperation between institutions in the field of international educational administration research is satisfactory, and the interaction between various institutions is active.
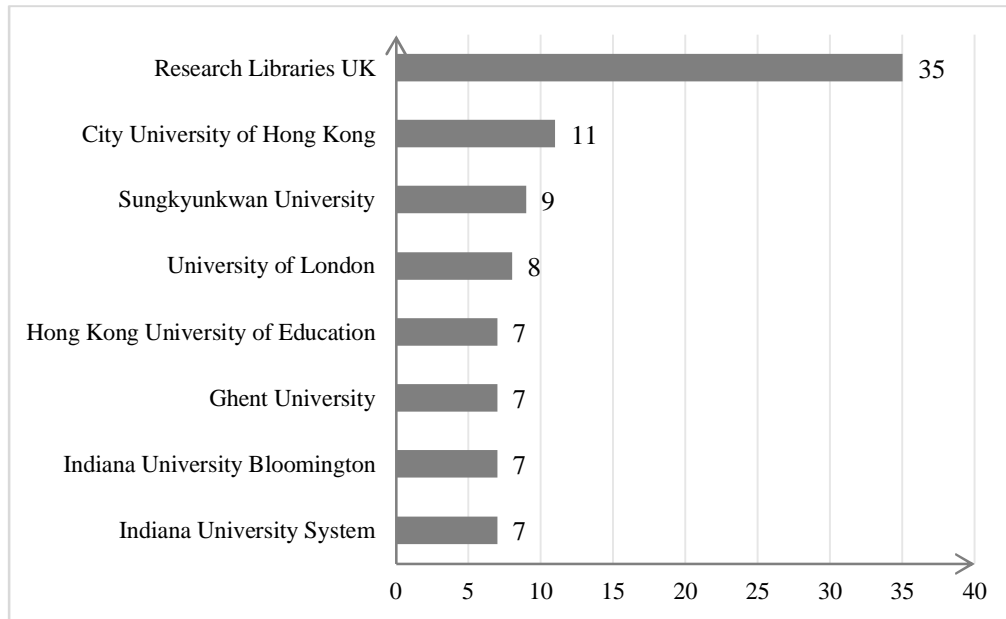
Figure 4 Publication volume of several institutions

3.High-Frequency Keywords

The author used CiteSpace to conduct co-word analysis on keywords in this section (Node Types=Keyword; Top10; Time Slices=1), extracting the top 10 keywords of highest frequency to represent the hotspots in the academia (as shown in Table 1). Generally speaking, frequency and centrality are reliable indicators for measuring the importance of keywords (Zeng, Lu, & He, 2018). The higher the centrality value of a node, the more keywords it connects and transmits information and the stronger its mediating role in the entire knowledge graph, thereby demonstrating its high importance (Zhao & An, 2014). Nodes with centrality values greater than 0.1 are referred to as key nodes(Tao & Shi, 2022). As shown in Table 1, although performance first shown up in 2012 ranks first in terms of the frequency, its betweenness centrality is not strong, and the highest centrality value is actually accountability, which ranks last in terms of word frequency though. In addition, there are some other influential keywords: higher education, policy, impact, government, leadership, determinants, public management, politics, accountability, etc. That means hotspots in international research on educational administration include higher education management, performance evaluation of higher education management, the impact of politics and policies on higher education management, the effects of higher education management, the relationship between government and higher education, the leadership of managers, the determining factors for the development of higher education management, higher education management and responsibilities.

Table 1 Top 10 high-frequency keywords

No.	Keywords	Year (first mentioned)	Frequency	Centrality Value
1	performance	2012	81	0.06
2	higher education	2015	41	0.02
3	policy	2013	38	0.16
4	impact	2015	37	0.10
5	government	2013	35	0.36
6	leadership	2012	31	0.04
7	determinants	2013	25	0.05
8	public management	2014	21	0.26
9	politics	2014	19	0.03
10	accountability	2012	19	0.26

In order to further explore the hotspots , the author conducted a qualitative analysis of some literature containing the keywords in Table 1. The detailed content is demonstrated in Table 2.

Table 2 Qualitative analysis of the hotspots

Hotspots	Authors	Year	Research Methods	Research Contents
Performance	Ford, Michael R.	2022	theoretical analysis, case studies, regression equation models	This article is based public governance theory explaining the performance of Wisconsin virtual charter schools. The results show that students experience short-term academic losses after transferring to virtual charter schools, and receive short-term academic benefits after returning to traditional public schools.
	Carsten Queseletc	2017	theoretical analysis, case studies, regression equation models	The focus of this study is on how principals in Swiss compulsory schools evaluate the participation of citizens and parents in educational governance. The results show that principals are skeptical of the authority of non professional participants to make decisions, and principals tend to adhere to professional discretion.
	Judith Hangartner etc	2022	theoretical analysis, case studies	This article, based on ethnographic research, takes Switzerland as an example, discusses the tension arising from the distributed leadership between and principals and teachers in primary schools. The author believes that the loose accountability system has

				created an opaque field of power relations, in which the necessity of autonomy in the allocation of leadership aligns with traditional claims of teacher autonomy.
	Rob Higham	2014	sample surveys, case studies	This article analyzes the individuals and organizations that accept the proposal for free schools. The free school policy makes governance an additional direct lever through which capable individuals can shape national education for their own benefit.
Educational Administration in Higher Education	Linda Dowling-Hetherington	2014	case studies	This article takes the Business School of Dublin University College as the research object, studying the types of institutional changes ("what"), the driving forces (reasons) of these changes, the top-down implementation methods, and the teacher's response to these changes ("how"). The article concludes by emphasizing the importance of understanding the potential impact of teachers' response to change on their institutional loyalty and commitment.
	Esther Dominique Klein etc	2022	case studies	This article investigates the professional development needs arising from the school improvement of 1,240 principals from nine German states, and how their needs are correlated with personal and school-related factors. The results indicate that the changes in the role of principals have not yet penetrated into their work practices.
	Ngoc Bich Khuyen Dinh etc	2021	focus group interviews	This article conducts interviews with 18 academic personnel and leaders from eight universities in China and Europe to study cognitive concepts, overview of effective academic leadership, and motivation to become academic leaders from a cross-cultural perspective.
Public Institutions and Macro-Political Issues	Chen Chen etc	2022	case studies	This article takes multinational universities as the research object to study how cross-border higher education obtains social licenses for operation. By examining the University of Nottingham Ningbo (UNNC) and Xi'an Jiaotong University (XJTLU) in China, the author discusses how universities can gain recognition from their host communities.
	Jolanta Urbanovič etc	2019	semi-structured interview	The author conducted interviews with 24 principals of primary and secondary schools from different regions of Lithuania to study educational management reforms that enhance school autonomy and their

				impact on inter-school cooperation and competition. The research results showed that government decisions have a significant impact on the relationship between schools, including management autonomy, school selection, fund allocation, and ranking.

Features and Evolution of the Research Content

The general information and research trends of the research on educational administration in the past decade have been elaborated based on the number of literature, research subjects, research institutions, and high-frequency keywords. Next, based on CiteSpace 6.2 software, this article will set the time slice to 1 and the threshold to top10 to generate and display keyword clustering and keyword highlighting graphs, and further explore the themes and trends in the field in the last 10 years.

1. Keyword Clusters: Research Hotspots

By using the LLR algorithm (log likelihood ratio) for screening and measurement, cluster keywords with hashtags are extracted, and a cluster graph of keywords is generated. As shown in Figure 5, referring to the parameters in the upper left corner, it can be seen that there are a total of 332 lines and 607 nodes, with a network density of 0.011. Q value (module value)=0.7818>0.3, indicating the significance of the network; the S-value (average contour value)=0.9056>0.7 indicates that the reliability of the clustering results. A total of 11 main clusters are generated (as shown in Figure 5). The author reads the relevant literature based on the main content of each clustering label, summarize the hotspots of the research to reflect the developments and hotspots in this field.

The main content of cluster #0 includes teacher autonomy, public service motivation, investment portfolio management models in the field of education and multi-level governance. Cluster #1 contains educational effectiveness, organizational commitment, educational governance, and educational autonomy. As to Cluster #2, it is mainly about services and performance, teacher satisfaction, supervisor responsibility, theoretical reform, etc. Cluster # 3 comprises distributed leadership, public service motivation, teacher development, performance indicators, etc. Cluster #4 includes public governance, accountability and performance, definition of responsibilities for non-profit schools, and labor relations. Cluster #5 embraces school management mode, teaching crisis management, university governance, multinational education, etc. The main content of cluster # 6 includes policy governance, network governance, organizational structure, government roles, etc. Cluster #7 consists of value creation, academic leadership, stakeholder relationships, and the role and responsibility of the chairman. Cluster #8 contains private educational institutions, stakeholder relationships, board stakeholder models, university governance, etc. The main content of Cluster #9 includes higher education reform, sustainable development of higher education institutions, and project-based research funding policies. Finally, Cluster #10 consists of university reform, institutional changes, institutional management, and institutional personnel.

Although the relevant researches in the sphere of educational administration can be divided into different clusters based on the frequency of keywords, studying the main content of representative literature under each cluster shows that the research content of different clusters is not completely independent. For example, the research content on teacher autonomy and teacher governance are

reflected in clusters #0, #1 and #3 (Hangartner & Svaton, 2022). Performance belongs to the key research objects of cluster #2 and #4 (Higham, 2014). The governance issues of policies and institutions are reflected in clusters #4, #5, and #10 (Dowling-Hetherington, 2016; Klein & Schwanenberg, 2022; Dinh, Caliskan & Zhu, 2021; Chen & Vanclay, 2023). Clusters #7 and #8 both focus on the topic of stakeholder relationships (Forfang, 2021).
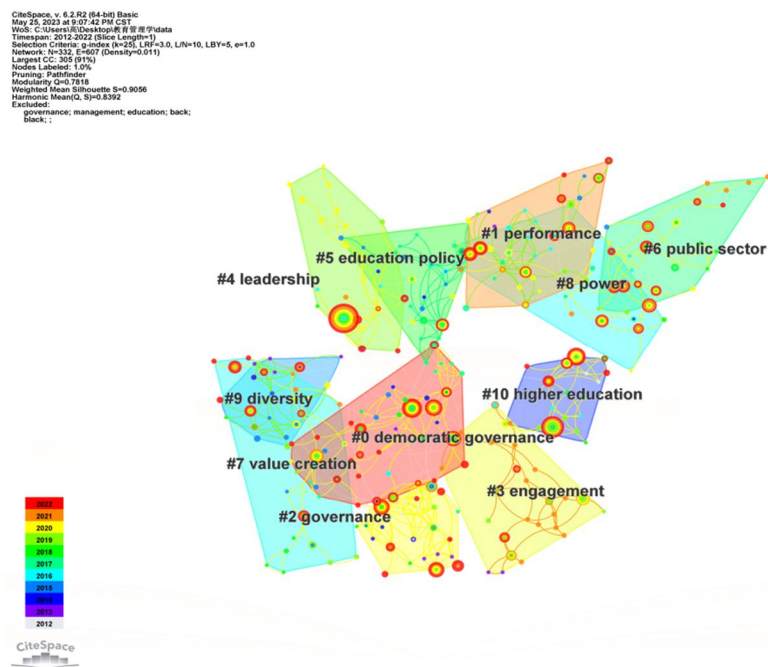

Figure 5 Clusters of keywords

2. Burst of Keywords: Research Trends

Figure 6 depicts the developments and evolution of educational administration research abroad over the past decade. The burst of keywords analysis on the collected samples indicates that since 2012, foreign education management research has increasingly shifted towards the following 10 themes: performance, new public management, trust, education policy, public management, sustainability, higher education, work, services, and university governance. The bold line segments in the figure indicate the specific period during which the words burst, thus showing the research trends for a specific time span. The figure shows that the research process of educational administration can reasonably be divided into three main stages.

The prominent words in the first phase(2015-2016) are performance and new public management. This indicates that international higher educational administration research at this stage tends to focus on employee's performance evaluation and new management models, one of which involve the developments of performance evaluation under new management models. The prominent words in the second stage(2017-2019) include education policy, sustainability, and higher education. The researches are particularly reflected in the attention to changes in educational policies and the exploration of sustainable development issues in higher education. The prominent words in the third stage (2019-2020) mainly contain work, service, and university governance. The research focus in this stage is specific to the internal

governance of universities, including specific university governance issues such as work performance and faculty services.

Keywords	Year	Strength	Begin	End	2012 - 2022
performance	2012	2.25	**2015**	2016	
new public management	2016	1.93	**2016**	2017	
trust	2016	1.79	**2016**	2017	
education policy	2017	3.3	**2017**	2018	
public administration	2018	3.78	**2018**	2020	
sustainability	2018	2.4	**2018**	2019	
higher education	2015	2.34	**2018**	2019	
work	2017	1.9	**2019**	2022	
service	2019	1.69	**2019**	2020	
university governance	2019	1.68	**2019**	2020	

Figure 6 Burst of Keywords

Conclusion

This research takes ad vantage of CiteSpace to visually and quantitatively analyze 500 literature in the field of educational administration from the Web of Science core collection database, supplemented by qualitative analysis. It demonstrates the evolution of the field based on the samples in the past decade, and clarifies the cooperation between scholars and institutions in this field. Overall, research in this field has gradually become the mainstream, and the annual publication volume has also shown an increasing trend year by year, which centers on higher education management, making it a key research object in the sphere. However, the current research force is relatively scattered, and the cooperation density between researchers is relatively low. Although strong synergy has been formed among various research institutions, the main cooperative forces are showing a trend of clustering, and an open, inclusive global cooperation network has not yet been formed. In the future, how researchers from various countries strengthen international cooperation and how institutions from different regions conduct research in a wider range of fields will be a key issue that needs to be focused on since it helps to promote the development of research. By analyzing the keyword clustering graph of research in this field, the research focus is summarized: democratic governance, performance, participation, leadership, education policy, public sector, value creation, rights, diversity, and higher education. Although the theoretical development in the field of education management is gradually maturing and improving, there is still a lot of room for development that requires the joint efforts of international scholars and institutions.

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