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A Comparative Analysis of Educational Leadership Research: Insights from U.S. and China based on CiteSpace

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Abstract:

Research on educational leadership in the United States began in the early 1980s, originating from principles of industrial and business management, with leadership theories and practices from business being adapted for educational settings. Over time, educational leadership theories have evolved through various interdisciplinary perspectives. The United States has produced extensive research on educational leadership, providing valuable insights for Chinese scholars. Most Chinese research is based on American experiences, with little comparative analysis between Chinese and American studies, and often relies on subjective content interpretation with limited use of scientific tools. This study uses CiteSpace, a scientific measurement software, to visually analyze Chinese and American research literature. It aims to objectively compare educational leadership research between the two countries, offering new ideas and perspectives for Chinese researchers.

Keywords: Educational leadership, China-US comparison, literature analysis, CiteSpace

1. Introduction

Research on Educational Leadership began in the United States in the early 1980s, originating from industrial and business management principles. Leadership theories and practices from business were adapted for educational settings. Over time, educational leadership theories have evolved through various interdisciplinary perspectives.

The United States has produced extensive research on educational leadership, providing valuable insights for Chinese scholars. Notable studies include Wong Wenyan and Fang Yufei (2007) on leadership education for American college students[1], Xu Su (2009) on training models and characteristics of American educational leaders[2], Lin Jian and Xu Zhidan (2014) on international engineering leadership education[3], Sun Zhenxiang (2014) on overseas school information leadership research[4], Hu Yujiao and Xiong Qiong (2016) on student leadership education in American colleges[5], and Zhao Leilei, Liang Qian, and Li Yuehong (2018) on foreign educational informatization leadership[6].

Most Chinese research is based on American experiences, with little comparative analysis between Chinese and American studies. They often rely on subjective content interpretation with limited use of scientific instruments. This article uses CiteSpace, a scientific measurement software, to visually analyze Chinese and American research literature. It aims to objectively compare educational leadership research between the two countries, offering new ideas and perspectives for Chinese researchers.

2. Research methods and data sources

2.1 Research methods and tools

Bibliometric analysis is a popular tool for quantitatively analyzing literature in specific fields, using various metrics and methods to identify structural characteristics, patterns, and development trends. CiteSpace, developed by Professor Chaomei Chen at Drexel University, is a Java application for visualizing literature analysis. It models bibliometric data to create maps that highlight key evolutionary paths in research fields, facilitating a shift from subjective to objective analysis. Since its launch in 2003, CiteSpace has been widely recognized and used in quantitative research across various fields. This paper uses CiteSpace 6.1.R1, released in 2022.

2.2 Data Sources

The scientific accuracy of knowledge mapping relies on its data foundation. To ensure rigor, this study sources Chinese literature from the China National Knowledge Infrastructure (CSSCI) and American literature from the

Web of Science Core Collection (SSCI). Using CiteSpace 6.1.R1 for bibliometric visualization, it analyzes 2,543 articles on educational leadership from the past eight years, revealing thematic context, knowledge evolution, and emerging trends.

The China National Knowledge Infrastructure (CNKI) is currently the largest Chinese database globally, with extensive resources. In the CNKI database, a search was conducted for journal articles using the advanced search option with the query: topic = educational leadership, and publication years from 2016 to 2021. All journals were selected as the source category, resulting in 409 relevant articles. After manually screening, 9 conference papers were excluded. The SSCI database covers the most authoritative social science journals worldwide and is the preferred choice for this study due to its powerful and comprehensive search capabilities. In the Web of Science Core Collection, a search was conducted with the query: topic = educational leadership, publication years = 2016-2021, document type = articles, country/region = United States, language = English, and database type = SSCI. This resulted in 2,293 relevant articles. Using CiteSpace's deduplication feature, the search results were processed to remove incomplete and duplicate records, yielding a final set of 2,143 relevant U.S. studies.

3. Comparison of Results

3.1 Basic Comparison Analysis

The number of publications is a key indicator for assessing the development trends of a field over a specific period. It also provides a clear view of changes in research intensity within that field, which is crucial for analyzing current trends and predicting future developments. This study uses Excel to perform statistical analysis on the sample literature.

Research on educational leadership in the United States predates that in China, with the earliest study by Valenti in 1952 on attitudes toward educational leadership. In contrast, research on educational leadership in China began in 1983, marking a 31-year difference in the initiation of research. As shown in Line Chart 1, between 2016 and 2018, the research dynamics in the U.S. were more active, with a steady upward trend, increasing from 93 articles in 2016 to 138 articles in 2021. In China, the period from 2016 to 2018 saw fluctuating growth, followed by a gradual decline. Specifically, Chinese publications was consistently fewer than American ones each year. In 2018, the difference between the two countries was the smallest at 26 articles, while in 2021, it was the largest at 80 articles.

This indicates that educational leadership research in China peaked in 2018 with 79 articles, which correlates with the release of the Ministry of Education's "Education Informatization 2.0 Action Plan" in 2018. Further categorization of related publications reveals that the number of articles on educational informatization leadership increased from 19 in 2017 to 35 in 2018, while the growth in other topics was minimal. Overall, the trend Chinese publication is unstable and shows a declining tendency, whereas U.S. research remains relatively stable and on the rise.

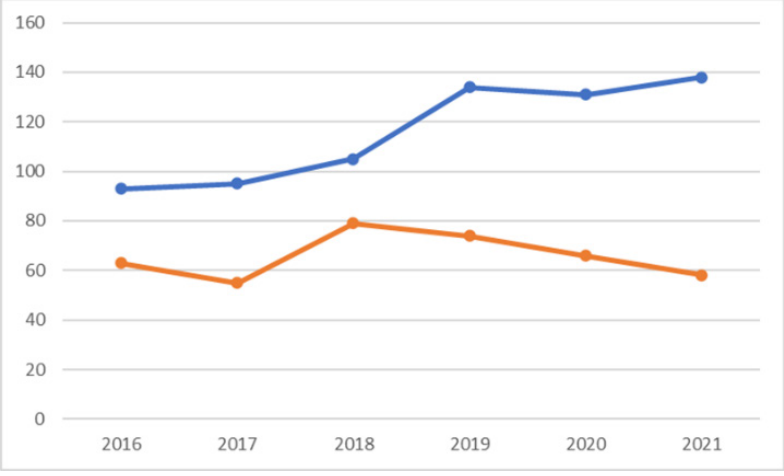

Figure 1 The Number of Publications of U.S. and China

3.2 Comparison of Subject Distribution

Subject classification can reflect the research perspectives, methods, and fields of the authors to some extent. From the overall development trend of disciplines, the subject distribution of educational leadership literature in China has grown from a few to many fields. Initially involving only education, management, and politics (2011), it now covers 15 disciplines, including nursing, sociology, industrial economy, and communication economy (2021). Edu-

cational leadership has become a field of multidisciplinary interest and cross-disciplinary research. However, looking at the specific composition of subject distribution, China's educational leadership literature shows an uneven development structure. Education (343 articles) dominates with 81.47%, followed by politics (19 articles), management (12 articles), library and information science (9 articles), and business administration (5 articles), with few articles in other disciplines (a total of 20 articles). Therefore, there is a need to strengthen the connection and research efforts in related disciplines, adopting multidisciplinary and multi-perspective approaches to conduct in-depth studies on educational leadership.

In the United States, educational leadership research spans 91 disciplines. Education and Educational Research dominate, accounting for 49.2% of all literature, with Nursing (81 articles) also relatively prominent, making up 10.69% of the total. Other significant fields include Education Scientific Disciplines (50 articles), Health Care Sciences Services (47 articles), and Public Environmental Occupational Health (42 articles). This shows that U.S. research is relatively dispersed, with a focus on medical fields, especially nursing, in addition to education. Tracing related literature further reveals that as early as 2004, the American Association of Colleges of Nursing (AACN) included leadership as part of the professional practice and performance standards for registered nurses. Since then, research on leadership education in nursing schools has increased, with many institutions offering leadership courses. In 2008, Cummings and colleagues systematically reviewed factors contributing to leadership, including individual behavior and practice, hospital environment, and practice environment, highlighting education activities such as Leadership Development Programs. This research accelerated the pace of leadership development programs in hospitals.

Table 1 Subjects Distribution of U.S. and China

NO.	Disciplines of Chinese Studies	The amount of Chinese Literature	Disciplines of American Studies	The amount of American Literature
1	Education	343	Education Educational Research	374
2	Politics	19	Nursing	81
3	Management	12	Education Scientific Discipline	50
4	Library, Information and Archival Science	6	Health Care Sciences Services	47
5	Business Management	5	Public Environmental Occupational Health	42
6	Nursing	5	Management	33
7	Basic Medicine	4	Urban Studies	32
8	Society	3	Psychology Educational	27
9	Industrial Economy	3	Health Policy Services	22
10	Communication Technology	2	Social Sciences Interdisciplinary	21

3.3 Keyword Comparison Analysis

Research hotspots refer to issues that are widely concerned by researchers, and keywords are a high-level summary of the research topic. In the literature related to the topic, keywords that appear more frequently are generally research hotspots in a certain field. Based on the analysis of CiteSpace software, keywords with higher betweenness centrality indicate that they appear more frequently with other keywords, which can be used to predict research hotspots in a certain field [7].

Table 2 Keys Words Comparison of U.S. and China

Keywords of Chinese Education Leadership				Keywords of American Education Leadership			
NO.	Keywords	Frequency	Centrality	NO.	Keywords	Frequency	Centrality
1	Leadership	109	0.26	1	Leadership	74	0.01
2	Headmaster	43	0.17	2	Teacher	61	0.11
3	University Students	24	0.27	3	School	53	0.01
4	Improvement Strategies	10	0.04	4	Student	52	0.04
5	Teachers	9	0.11	5	Policy	43	0.03
6	University Counselors	8	0.03	6	Impact	43	0.02
7	Informatization	7	0.12	7	Performance	38	0.04
8	Colleges and Universities	7	0.03	8	Professional Development	37	0.01
9	Core Literacy	6	0.01	9	Educational Policy	37	0.06
10	Talent Development	6	0.03	10	Outcome	31	0.15
11	New Era	5	0.01	11	Management	28	0.03
12	Enlightenment	5	0.01	12	Model	28	0.01
13	Cultivating	5	0.01	13	Race	28	0.01
14	AI	5	0.01	14	Community	27	0.23
15	Internet	4	0.01	15	Health	27	0.07
16	Information Literacy	4	0.02	16	Care	26	0.02
17	Basic Education	4	0.01	17	Perception	26	0.07
18	Teaching Quality	3	0.01	18	Perspective	26	0.01
19	Primary and Secondary Schools	3	0.01	19	Program	26	0.01
20	Information Technology	3	0.01	20	Social Justice	24	0.03

In the CitespaceR6.1.R1 software interface, we selected keywords to run, and obtained a keyword co-occurrence network of important Chinese educational leadership documents, including 214 network nodes, 190 network links, and a network density of 0.0073 (Figure 2). This paper summarizes the frequency of high-frequency words and their betweenness centrality of keywords in important Chinese educational leadership documents that appear more than 20 times (Table 2 and Line Figure 2). The size of the keyword node indicates the frequency of occurrence of the keyword. The larger the node, the higher the frequency of occurrence of the keyword, and vice versa. As shown in Table 2, leadership appears most frequently, appearing in 109 documents, accounting for 26.7% of the total number of publications, with the largest number of publications in 2017, reaching 19 articles; principals rank second in frequency, appearing in 43 documents, accounting for 10.5% of the total number of publications, reaching the maximum number of 9 articles in 2019, and university students rank third, with the highest number of publications in 2017, appearing in 6 documents, followed by keywords such as improvement strategy (10 times), teachers (9 times), and university counselors (8 times). In CiteSpace, centrality is the betweenness centrality, which is an indicator of the importance of a node in the network, mainly used to discover and measure the importance of documents. In general, a node with a centrality greater than or equal to 0.1 is called a key node. The node has strong betweenness, and there are many studies based on it, which has a strong influence. From Table 2, we can find that the five keywords leadership (0.26), university students (0.27), informatization (0.12), teachers (0.11) and improvement strategies (0.04) are the core contents of educational leadership. From the high-frequency word list, we can also find that the main research content of educational leadership is concentrated in colleges and universities, talent development, and information literacy, and pays more attention to practicality and innovation. This also indirectly reflects that the professional fields in which China's educational leadership is applied are not broad enough, and the application and popularization in other fields is not high.

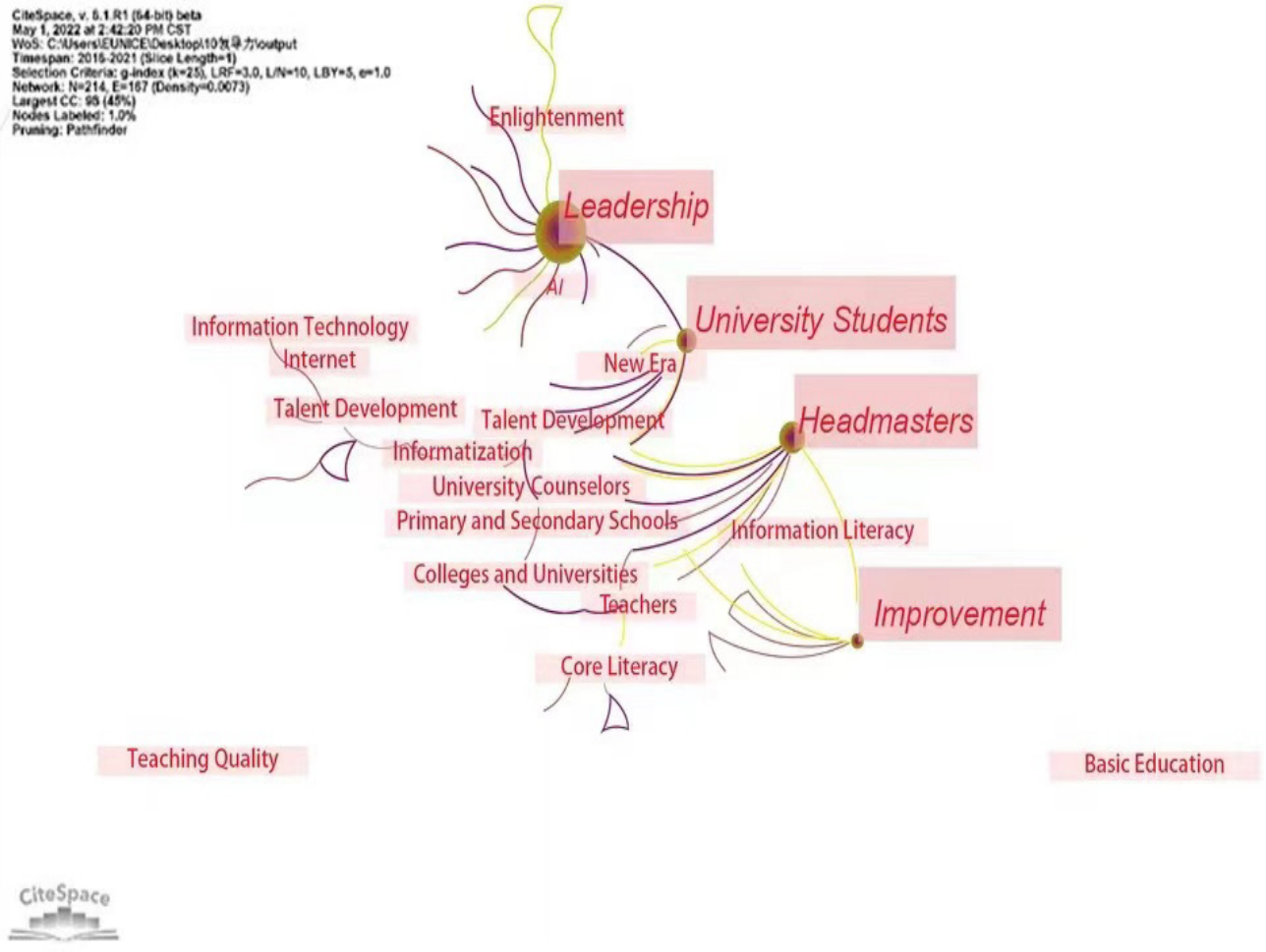

Figure 2 Keyword Co-Occurrence Network

Based on Figure 3 and Table 2, the keyword co-occurrence network in the literature on educational leadership in the United States consists of 280 network nodes and 460 connections between these nodes, indicating a strong relationship between the keywords. Among them, "leadership" appears with the highest frequency. The most cited work is Nathan Favero's 2016 paper titled "Goals, Trust, Participation, and Feedback: Linking Internal Management with Performance Outcomes [8]." Favero's research examines the relationship between internal management and educational performance from the perspective of subordinates (rather than the managers themselves) in over 1,100 schools in New York City. The study highlights that setting challenging goals by managers is particularly important for achieving educational outcomes. The second most frequent keyword is "teacher," with the most cited work being Muhammad A. Khalifa's 2016 paper titled "Culturally Responsive School Leadership: A Synthesis of the Literature." Khalifa discusses the importance of culturally responsive school leadership (CRSL) in culturally responsive education, educational reform, and social justice education [9]. The framework of his discussion revolves around CRSL and teacher preparation, CRSL and school environment, as well as CRSL and community advocacy.

The third most frequent keyword is "school," indicating that educational leadership is primarily applied in school settings. Following closely are keywords such as "policy," "impact," and "performance," which mainly pertain to the outcome variables of educational leadership. From Table 2, it is evident that the betweenness centrality of keywords such as "community," "outcome," "teacher," "health," and "perception" are 0.23, 0.15, 0.1, 0.7, and 0.7 respectively, indicating that research on educational leadership in the United States has expanded to include areas outside of schools.

Figure 3 Keyword Co-Occurrence Network

4. Conclusion

This paper conducts a comparative analysis of educational leadership research in China and the United States, yielding several conclusions. First, the research on educational leadership began earlier in the U.S., with the earliest study dating back to 1952, while China's research started in 1983, indicating a 31-year gap. From 2016 to 2021, the U.S. showed more active research dynamics, with a steady increase in the number of publications, whereas China's research saw fluctuating growth from 2016 to 2018, followed by a decline. Additionally, U.S. research is relatively dispersed, with significant exploration in medical fields, particularly nursing, besides education. In contrast, Chinese research focuses on the leadership of principals, college students, and counselors.

Moreover, educational leadership literature in China is predominantly concentrated in education, accounting for the majority of publications, with fewer studies in other disciplines. In the U.S., research spans 91 disciplines, showing a multidisciplinary approach, with education and educational research being predominant, along with considerable studies in nursing, health care sciences, and services. Methodologically, Chinese research mainly relies on introducing American experiences with little comparative analysis between China and the U.S., often depending on subjective content interpretation and lacking scientific measurement tools. In contrast, American research employs a more diverse and scientific approach.

Policy-wise, the peak in Chinese research in 2018 correlates with the Ministry of Education's "Education Informatization 2.0 Action Plan," highlighting the influence of policy directions on research trends. Overall, the publication trend of Chinese literature is unstable and shows a declining tendency, whereas U.S. research remains relatively stable and is on the rise. This paper provides new perspectives and methods for Chinese researchers, emphasizing the importance of multidisciplinary approaches and scientific measurement tools in educational leadership research.

5. Implications and Future Prospects

The U.S. employs a multidisciplinary approach in educational leadership research, incorporating fields such as education, nursing, and health sciences. Chinese research should adopt this multidisciplinary integration to better understand and explore educational leadership comprehensively. The widespread use of scientific measurement tools like CiteSpace in U.S. research enhances objectivity and accuracy. Chinese research should also increase the

application of such tools to improve the scientific rigor and verifiability of its studies.

The research indicates that policy significantly impacts educational leadership studies. For instance, the research peak in China in 2018 was linked to the Ministry of Education's release of the "Education Informatization 2.0 Action Plan." Future researchers should closely monitor policy developments and explore their effects on educational leadership. The U.S. research trend is relatively stable and upward, whereas Chinese research shows fluctuations and a downward trend. China needs to maintain continuous investment and attention in educational leadership research to foster long-term development in this field.

The U.S. experiences in leadership education in nursing and other areas provide valuable insights for China. Chinese research should strengthen the exploration of leadership practices in various educational settings and develop suitable leadership training programs based on specific practical needs. Enhancing cooperation and exchange between China and the U.S. in educational leadership research can help share research outcomes and elevate global research standards. China should actively participate in international academic exchanges to learn and incorporate advanced international experiences.

In conclusion, future educational leadership research in China should emphasize multidisciplinary integration, the application of scientific measurement tools, policy impact analysis, stable and sustained research efforts, practical exploration, international collaboration, and data-driven research methods. These measures will help enhance China's research level and international influence in the field of educational leadership.

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