

Analysis on Academic Papers of Major Research Institutions in China in the Past Decade

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Abstract: Taking the literature in the field of electrification education in the database of CNKI journals from 2010 to 2019 as the research sample, using tools such as Excel, SPSS and UCINET, combined with literature measurement, visual analysis, social network analysis, etc. Analyze and research the academic papers of 20 major research institutions in three dimensions of the institutional theme, summarize the academic output, academic influence and research hotspots of major research institutions in the field of electrification education in China in the past ten years, and identify common research among different research institutions. The theme has certain research significance and innovation.

1. Introduction

Since the emergence of China's electrification education in the 1930s, it has undergone several stages, including initial development, preliminary development, rapid development, and in-depth development [1]. From earlier audiovisual education to information education [2]. In the course of development in the past century, China's research and development of electrification education has been continuously strengthened, and the number of research institutions has been increasing. In order to understand the distribution and development of major research forces in the field of electrification education in China, this article takes high-level papers published in the field of electrification education in the past decade as the research object, and comprehensively uses research methods such as bibliometric analysis, visual analysis, and social network analysis. Research, analysis of academic papers of major research institutions in three dimensions: volume, frequency of citations and research topics, revealing in depth the scientific research production capacity, academic influence and research direction of major research institutions [3]. Evaluation provides valuable support and reference.

2. Research Design

2.1 Research Methods

This paper mainly uses the bibliometric analysis method, visual analysis method, and social network analysis method to describe and analyze the research output, academic influence, and research theme of the major domestic research institutions of electrification education. Bibliometric analysis method refers to the method of statistical analysis through literature attribute data to obtain research conclusions [3]; Based on bibliometric data, this article uses SPSS to analyze the number of academic papers published by major research institutions, which can objectively describe each institution's post share and trend. The visual analysis method is to display the abstract data as a graphic image to help find out the information behind the data. This paper uses Excel to draw the paper total time distribution chart, Boston matrix chart and other graphics, and uses NetDraw in UCINET to draw Institution-theme two-mode network diagram, which visually presents the research output, academic influence and research themes of major research institutions. Social network analysis is a set of norms and methods for analyzing the relationship structure and attributes of social networks. It is now widely used in information and knowledge. This paper can understand the academic institutions of research institutions through two-mode network centrality

analysis. Thematic features of the thesis.

2.2 Data Processing

The data of this study were retrieved from CNKI database journal literatures, and the literature search conditions were set: “China Classification Number” = “G43 / Electrification Education”; Literature search time range: 2010-2019; Source category: CSSCI; Search time: 2020 February 9. After traversing all the documents and excluding non-academic documents such as announcements, information, and notices, a total of 12017 academic papers were retrieved. On this basis, 5589 academic papers of TOP20 research institutions were selected and determined as the data samples for this study.

3. Data Analysis

3.1 Analysis of Institutional Academic Papers

Figure 1 shows the overall distribution of academic papers of TOP20 major research institutions in the field of domestic electrification education in the past decade. Starting from 412 articles in 2010, the overall volume of postings showed an upward trend, reaching a peak of 717 articles in 2016, which indicates that the research on electrification education has continued to receive continuous attention from major research institutions. After 2017, the number of publications began to decline, and the research fever began to decline, indicating that the domestic e-education research will enter a mature period of stable development.



Fig.1 Distribution of Total Papers Issued by Major Domestic Research Institutions from 2010 to 2019

The number of papers issued by various research institutions in the field of electronic education can intuitively reflect their overall research level in this field. Based on Table 1, it can be seen that in the past ten years, Beijing Normal University has taken the lead in publishing 927 articles, followed closely by East China Normal University, Central China Normal University, South China Normal University, and Northeast Normal University. These five universities account for the main research institutions. 3001 papers accounted for about 54%; Zhejiang Normal University, Qufu Normal University, and Zhejiang University had the smallest number of papers, all of which were below 2%.

Table 1 Characteristics of The Total Number of Papers Issued by Major Domestic Research Institutions

NO	INST	NUM	%	μ	σ	CV	NO	INST	NUM	%	μ	σ	CV
1	BNU	927	16.59%	92.70	26.14	0.28	11	NNU	197	3.52%	19.70	6.53	0.33
2	ECNU	635	11.36%	63.50	16.59	0.26	12	SWU	157	2.81%	15.70	7.12	0.45
3	CCNU	538	9.63%	53.80	27.60	0.51	13	THU	156	2.79%	15.60	8.66	0.55
4	SCNU	497	8.89%	49.70	14.83	0.30	14	JU	155	2.77%	15.50	9.73	0.63
5	NENU	404	7.23%	40.40	16.05	0.40	15	NCET	143	2.56%	14.30	5.27	0.37
6	NWNU	279	4.99%	27.90	5.90	0.21	16	NJU	127	2.27%	12.70	5.10	0.40
7	JNU	276	4.94%	27.60	10.80	0.39	17	HU	120	2.15%	12.00	5.01	0.42
8	SNNU	261	4.67%	26.10	9.23	0.35	18	ZNU	107	1.91%	10.70	2.98	0.28
9	PKU	205	3.67%	20.50	12.25	0.60	19	QNU	106	1.90%	10.60	3.50	0.33
10	CNU	200	3.58%	20.00	4.50	0.22	20	ZJU	99	1.77%	9.90	4.95	0.50

In order to further reveal the statistical characteristics of the amount of papers issued by various research institutions, the average value of the amount of papers (27.95) and the average value of the coefficient of variation (ie, the ratio of the standard deviation to the mean) of the papers (0.39) are taken as the dividing points on the horizontal and vertical axes. The main research institutions are divided into four quadrant Boston matrix diagrams, as shown in Figure 3.

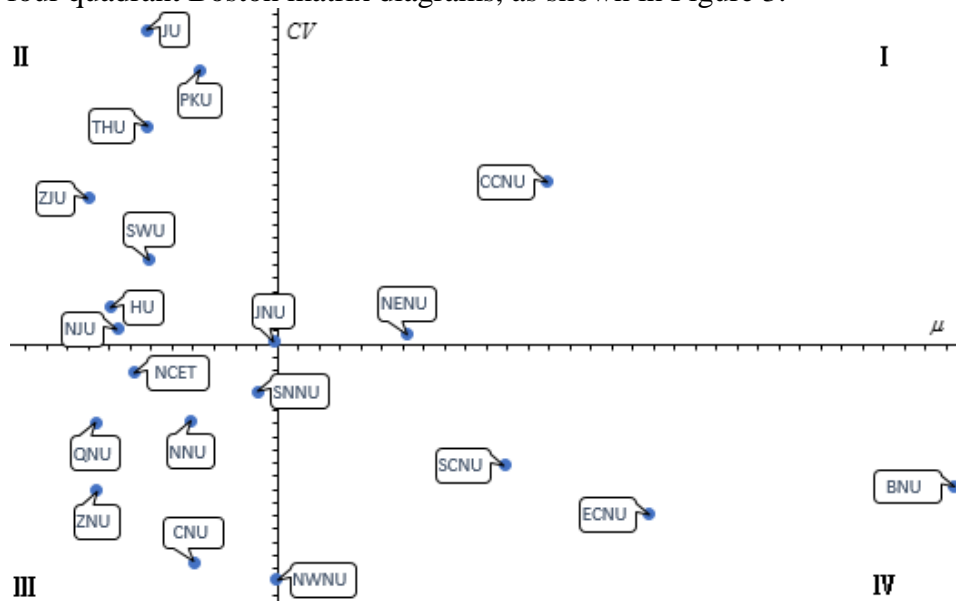


Fig.2 Boston Matrix Distribution of Papers Published by Major Domestic Research Institutions

In Figure 2, the coefficient of variation index on the vertical axis represents the change in the amount of papers issued by the research institution over time, and the index of the average value on the horizontal axis reflects the proportion of papers issued by the research institution. All research institutions are grouped into four quadrant matrices. Among the four quadrants, the quadrant I is characterized by academic paper occupancy and growth rates higher than the average. It belongs to the backbone of the development of electrification education, mainly including Central China Normal University and Northeast Normal University. The quadrant II is mainly composed of Jiangnan University and Beijing. University, Tsinghua University, Zhejiang University, Southwest University, Henan University, Nanjing University, and Jiangsu Normal University are composed of 8 institutions. The quadrant is characterized by a low share of papers, but the growth rate is higher than the average, indicating that they are China's electrification education Academic potential institutions for research; The occupancy rate and growth rate of institutions included in the quadrant III are below average, mainly including Northwest Normal University, Shaanxi Normal University, Capital Normal University, Nanjing Normal University, Central Television Education Center, Qufu Normal University, and It consists of 7 institutions, including Zhejiang Normal University, indicating that they are research institutions that slow the growth rate. The quadrant quadrants are Beijing Normal University, East China Normal University, and South China Normal University. They have a high share of publications, and the growth rate is lower than the average. Value, is a strong research institution in the field of electrification education.

3.2 Analysis of Cited Frequency of Institutional Academic Papers

If the total number of papers is an important indicator that reflects the contribution of a research institution to the research field, then the frequency of citations can be used as an important indicator of the qualitative contribution of the research institution to the research field. The statistics of the total cited frequency and the cited frequency of all research institutions' publications are shown in Table 2.

Table 2 Statistics of Papers Cited by Major Domestic Research Institutions

NO	INST	NUM	CITED	MEAN	NO	INST	NUM	CITED	MEAN
1	BNU	927	29380	31.69	11	NNU	197	4690	23.81
2	ECNU	635	21552	33.94	12	SWU	157	2193	13.97
3	CCNU	538	10371	19.28	13	THU	156	11341	72.70
4	SCNU	497	17181	34.57	14	JU	155	2771	17.88
5	NENU	404	11014	27.26	15	NCET	143	3859	26.99
6	NWNU	279	6761	24.23	16	NJU	127	6466	50.91
7	JNU	276	10731	38.88	17	HU	120	2237	18.64
8	SNNU	261	5446	20.87	18	ZNU	107	1731	16.18
9	PKU	205	4143	20.21	19	QNU	106	1928	18.19
10	CNU	200	4026	20.13	20	ZJU	99	1463	14.78

According to Table 2, referring to the total academic paper ranking and total citation frequency ranking of each research institution, the comprehensive ranking of the academic academic paper total and citation total can be further drawn, as shown in Figure 3.

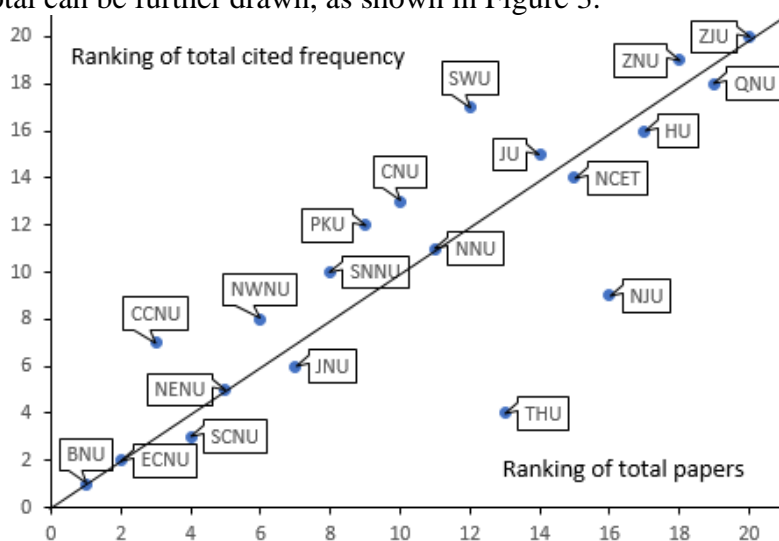


Fig.3 Ranking of Cited Papers by Major Research Institutions in China

Combining Table 2 and Figure 3, we can see that the total number of academic papers and total citations of Beijing Normal University and East China Normal University are both high, indicating their academic advantages and leading position in the field of electrification education; South China Normal University is closely followed, Tsinghua University, the total citation frequency ranking is higher than the total number of papers, showing a good academic background and strong research strength; Central China Normal University, Northwest Normal University, Shaanxi Normal University, Peking University, Capital Normal University, Southwest University The rankings of the total number of citations and Zhejiang Normal University are lower than the total number of academic papers. For example, a single thesis of Southwest University has been cited for a minimum of 13.97 times, indicating that the research results need to be further recognized and paid attention to; Qufu Although the total number of academic papers of Normal University, Nanjing University, Henan University, and Central Educational College is lower, the total number of cited papers is better than the total number of academic papers. Judging from the cited index of a single paper, Tsinghua University and Nanjing University are highly recognized. In 2013, Tsinghua University's Information Technology Center Zhong Xiaoliu, Song Shuqiang, Jiao Lizhen and others published “Research on Instructional Design in Informatized Environments Based on the Concept of Flip Classroom”, which was cited 3665 times.

3.3 Analysis of the Topics of Academic Papers in Research Institutions

The key words are the condensing and refining of the core content of the paper, which can highly summarize the basic content of the paper. Through a large number of key words appearing in the academic papers of research institutions, you can understand the main research directions of the

With reference to Figures 4 and 3, it can be seen that Beijing Normal University, East China Normal University, Central China Normal University, South China Normal University, Northeast Normal University and other nodes have higher degree of centrality, intermediate degree of centrality, and lower proximity of centrality, indicating that These units have significant advantages in the field of electrification education, the role of knowledge media, and the degree of unrestrainedness. They play a very important role in the research progress and knowledge flow in this field. Therefore, they are the core research institutions in the field of electrification education in China; Although Jiangsu Normal University, Shaanxi Normal University, Northwest Normal University, and Central Electrification Education Center have average degree of centrality, they also serve as important platforms for the flow of knowledge in this field. This is also an important research institution in the field of electrification education in China; Zhejiang University, Qufu Normal University and Zhejiang Normal University are in a relatively marginal position. Looking at the node position and centrality of high-frequency keywords, education informatization, classroom flipping, online learning, and MOOC are core high-frequency keywords in the field of e-learning; mobile learning, distance education, information technology, online courses, and Internet Curriculum, instructional design, empirical research, learning analysis technology, and open education resources are important high-frequency keywords in the field of e-education; while learning meta, education technology, electronic textbooks, digital learning, educational technology, and e-education can be considered as High frequency keywords in the field of electrification education.

In terms of the number of research areas of various research institutions, Beijing Normal University has the most extensive research scope, reaching 28; East China Normal University, Central China Normal University, South China Normal University, and Northeast Normal University are the second largest. Relatively speaking, Zhejiang University, Qufu Normal University and Zhejiang Normal University have a narrow research scope in the field of electrification education, with only 1-2 focused research directions. Based on the research topics of various research institutions, combined with Figure 4, it was found that the distances between Central China Normal University, Northeast Normal University, Northwest Normal University, and Jiangsu Normal University are relatively close to each other, indicating that the research topics are relatively close, and most of them focus on education informatization, online learning, In terms of flipping classrooms and mobile learning, the research topics of Shaanxi Normal University, Tsinghua University, and Peking University focus on education informatization, online learning, lessons, flipping classrooms, distance education, and online courses. In addition, East China Normal University Universities and South China Normal University have common research themes in information technology, online courses, instructional design, personalized learning, e-schoolbags, and collaborative learning.

4. Research Conclusions

This research takes 5589 academic papers of TOP20 research institutions in the field of domestic education as the research object. Based on quantitative analysis with the help of tools such as Excel, SPSS and UCINET, combined with qualitative thinking, the papers are divided from the number of posts, the frequency of citations, and the theme of the institution. An analysis of the academic papers of these research institutions in the past ten years in three dimensions, and draws the following conclusions:

(1) From the perspective of the total number of papers issued by institutions, the total number of papers published in the past ten years has shown an upward trend. Beijing Normal University has the largest number of papers and the highest academic contribution rate. It is followed by East China Normal University, Central China Normal University, South China Normal University, and Northeast China. Normal universities; Zhejiang Normal University, Qufu Normal University, and Zhejiang University have relatively low academic contributions. Combined with the Boston Matrix analysis, Beijing Normal University, East China Normal University, and South China Normal University are among the most powerful research institutions in electrification education research;

Central China Normal University and Northeast Normal University have higher occupation rates and growth rates, and are the backbone development forces in the field of electrification education. ; Jiangnan University, Peking University, Tsinghua University, Zhejiang University, Southwest University, Henan University, Nanjing University, and Jiangsu Normal University have higher growth rates and are academic potential institutions for electrification education research; Northwest Normal University, Shaanxi Normal University, Capital Normal University, Nanjing Normal University, Central Audio-visual Education Center, Qufu Normal University, and Zhejiang Normal University are institutions that have slowed down research in the field of electrification education.

(2) From the perspective of citations of institutional papers, both Beijing Normal University and East China Normal University are ranked high in the total number of academic papers and total citations, indicating their academic advantages and leading positions in the field of electrification education; South China Normal University, Tsinghua University Universities, the total citation frequency ranking is higher than the total number of papers, and Tsinghua University has the highest citation index per article; Central China Normal University, Northwest Normal University, Shaanxi Normal University, Peking University, Capital Normal University, Southwest University, and Zhejiang Normal University The total number of citations is lower than the total number of academic papers, indicating that the recognition and attention of research results need to be further improved; Qufu Normal University, Nanjing University, Henan University, and the Central Electronic Education Center have ranked the total number of academic papers. It is lower, but its ranking of the total number of citations is better than the ranking of the total number of academic papers.

(3) From the perspective of institutional themes, Beijing Normal University, East China Normal University, Central China Normal University, South China Normal University, and Northeast Normal University are the core research institutions in the field of domestic education; Jiangsu Normal University, Shaanxi Normal University, and Northwest Normal University The Central Educational Education Center is an important research institution; Zhejiang University, Qufu Normal University, and Zhejiang Normal University are in a relatively marginal position. Overall, the hot topics of research by the 20 major research institutions are mainly focused on education informatization, flipped classrooms, online learning, and MOOCs. Different research institutions have common research topics, such as Central China Normal University, Northeast Normal University, Northwest Normal University, and Jiangsu Normal University, which have a lot of focus on education informatization, online learning, flipped classrooms, and mobile learning, which helps academic exchanges. Cooperation.

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