RESEARCH ON THE HOT SPOTS OF BLENDED LEARNING BASED ON LITERATURE KEYWORDS

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ABSTRACT: *Taking CNKI China academic journal network publishing the relevant papers on the Blended learning in the pool as the research subject, the co-occurrence analysis and social network technology use of key words, were identificated and co-author, on the basis of the results visualization analysis of hybrid research hotspot in the field of teaching, and the existing literature on this field as a concise and analyzed. Hybrid teaching research in China, fluctuated type development, has formed a certain scale of cooperation group, and the research content is extensive, the hybrid teaching research hot topic is: based on the online course teaching mode applied research, the Internet under the background of hybrid teaching application field of research, construction of hybrid teaching environment and classroom teaching reform based on hybrid teaching research.*

KEYWORDS: blended learning, keywords co-occurrence, social network analysis

INTRODUCTION

In order to fully revitalize undergraduate education, in 2019, the ministry of education issued the implementation opinions on the construction of first-class undergraduate courses, proposing to implement the " Double 'Ten Thousand' Plan " for first-class undergraduate courses. After three years or so, 10,000 first-class undergraduate courses will be completed at the national level and 10,000 at the provincial level. among them, the number of state-level first-class undergraduate courses identified as the largest is the combination of online and offline first-class courses, a total of about 6,000. The importance of Blended teaching can be seen, so what is the hot spot and trend of Blended teaching? In this paper, key words co-emergence technology and social network analysis method are used to combine quantitative and qualitative analysis to understand the development process of Blended teaching, briefly analyze the coauthors of scholars in the field of Blended teaching, and draw the map of Blended teaching

knowledge, so as to provide strong support for future research on Blended teaching development.

Research Design

Data Sources

In this paper, the papers published in CNKI Chinese academic journals' online publication database were used as literature sources, and the key words "Blended Teaching" and "Blended Learning" were searched. The source categories were core journals and CSSCI, and 870 articles were retrieved. Through manual screening of literature, invalid literature without author, literature without keywords, conference, call for papers and other invalid literature was removed. Finally, 823 valid research literatures were obtained, with 1679 keywords and a cumulative frequency of 3537.

RESEARCH METHODS AND TOOLS

The main methods used in this study are word frequency analysis, social network, system clustering and multidimensional scale analysis. The research tools are Bicomb, Ucinet, NetDraw, Excel and SPSS as statistical analysis software. In this study, the paper data retrieved on CNKI were counted by Biocmb software, including the number of published papers, the source of papers, the research institution, and the frequency of the occurrence of overall keywords, etc., to construct the high-frequency word co-occurrence matrix. Through Excel software, the high-frequency word co-occurrence matrix is transformed into the dissimilar matrix. The analysis diagram of social network was constructed by Ucinet software. Through SPSS, the system clustering analysis and multi-dimension scale knowledge map analysis were carried out to finally realize the visualization analysis of high-frequency keywords.

RESEARCH RESULTS AND ANALYSIS

STATISTICAL ANALYSIS OF THE NUMBER OF PUBLICATIONS

According to the statistics of literature retrieved, the annual number of papers published in hybrid teaching is shown in figure 1.As can be seen from the figure, the earliest papers on blended teaching appeared in 2003, and the number of published papers did not exceed 30 from 2003 to 2009.From 2009 to 2015, the annual number of papers published is 30-40, which is a stable period for the development of hybrid teaching research. The following three years, that is, 2015-2017, are the three years with the fastest development of blended teaching, belonging to the growth period of blended teaching. Since 2017, the research on hybrid teaching has stabilized, that is, the stable period of growth.
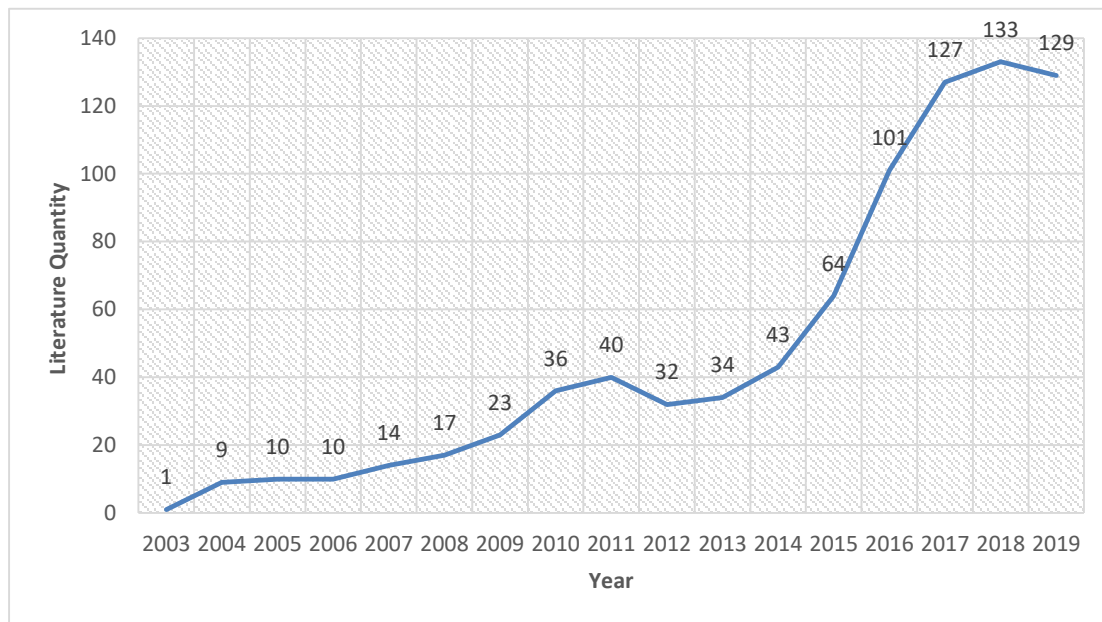
Figure 1. distribution diagram of annual distribution quantity of mixed teaching materials

Source Analysis of the Paper

In order to understand the development of hybrid teaching in China in more detail, the journal source statistics of academic papers were conducted. According to the statistics, 823 papers were distributed in 150 journals, and the maximum number of published papers was 99. According to price's law formula, the number of published papers in core journals should be greater than 7. Table 1 shows the journals with more than 7 published papers in this study. From the table, a total of 21 kinds of journals, issued a total of 581 papers, more than 70 percentage, specific journal name as shown in table 1, the "modern education technology", "China audio-visual education", "audio-visual education research" and "Chinese distance education" and so on four kind of number more than a third of the total number of the journal articles, thus these for hybrid the core of the teaching and research of the core periodicals.

Table 1. Distribution of mixed teaching journals

SN	Journal name	Number of published papers	Percentage (%)
1	Modern educational technology	99	12.0438
2	Chinese audio-visual education	68	8.2725
3	Research on audio-visual education	63	7.6642
4	Distance education in China	51	6.2044
5	Journal of distance learning	28	3.4063
6	Open education research	27	3.2847
7	Adult education in China	27	3.2847
8	Teaching in Chinese universities	26	3.1630
9	Vocational and technical education in China	24	2.9197
10	Education and career	21	2.5547
11	Adult education	21	2.5547
12	Experimental technology and management	21	2.5547
13	Modern distance education research	15	1.8248
14	Modern distance education	14	1.7032
15	Teaching and management	13	1.5815
16	Laboratory research and exploration	12	1.4599
17	Vocational and technical education	11	1.3382
18	Educational theory and practice	11	1.3382
19	Audio-visual teaching of foreign languages	11	1.3382
20	Vocational education BBS	9	1.0949
21	Chemistry education (Chinese and English)	9	1.0949
	Total	581	70.6813

Analysis of Research Institutions

The analysis of the author's institution helps us to clearly understand the current situation of hybrid learning research in different institutions. According to the price law formula, the number of papers issued by the core institutions should be greater than 2. The statistical results are shown in table 2. As can be seen from the table, there are a total of 30 institutions, among which 29 are institutions of higher learning, the other one is a provincial educational unit, and 14 are normal colleges and universities. Therefore, normal colleges and universities are the backbone of hybrid teaching research.

Table 2. Distribution of research institutions

SN	Institutions	Amount	SN	Institutions	Amount
1	Beijing normal university	27	16	Shantou radio and television university	4
2	Tsinghua university,	21	17	Shandong normal university	4
3	Peking University,	16	18	Jiangnan university,	4
4	Shanxi normal university	13	19	Henan education informatization development research center	4
5	Nanjing normal university	11	20	Chongqing radio and television university	3
6	Central China normal university	11	21	China agricultural university	3
7	South China normal university	10	22	Zhejiang normal university	3
8	Shanxi normal university	7	23	Yunnan university	3
9	Henan university	7	24	China West normal university	3
10	Northeast normal university	7	25	Tongji university,	3
11	Capital normal university	6	26	Shenyang normal university	3
12	Jiangsu normal university	6	27	Shanxi datong university	3
13	Zhengzhou university	5	28	Jiangsu institute of technology	3
14	Guangzhou university	5	29	Jiangsu university	3
15	Northwest normal university	4	30	Guangxi electric power vocational and technical college	3

Analysis of Study Authors

When conducting research on a topic, the core authors and co-authors help us to understand the topic more deeply and effectively. According to statistics, a total of 49 authors have published more than three papers, among which the top three are Xibin Han (7 papers), Xiaoying Feng (7 papers) and Kekang He (7 papers).At the same time, Bicomb, Ucient and NetDraw software were used to draw the knowledge map of co-authors in hybrid teaching, as shown in figure 2.As can be seen from the figure, there are a total of 11 cooperative groups, which do not form a large-scale research group,

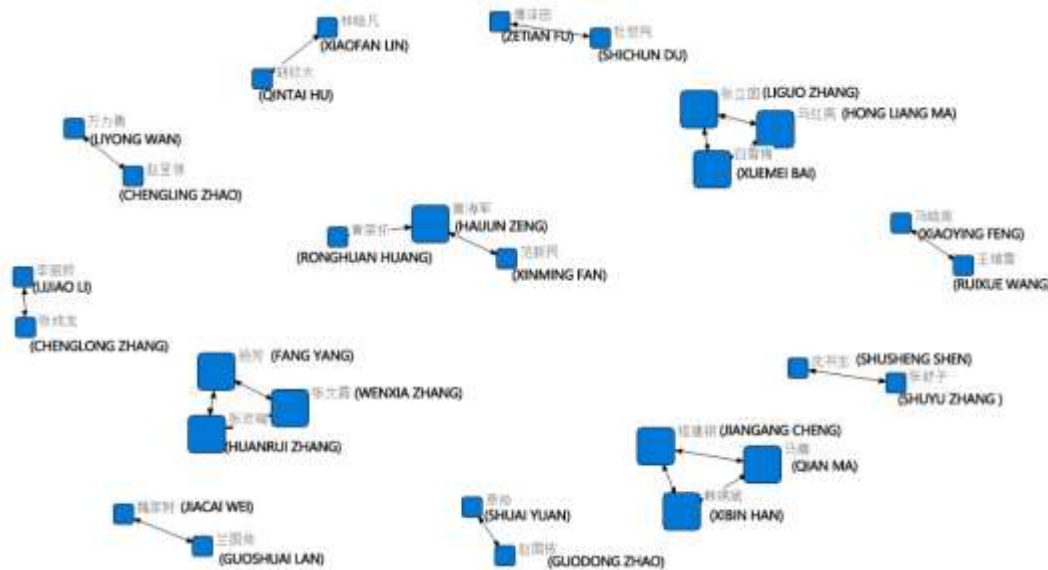and the research topics are relatively scattered.

Figure 2. Co-author atlas of hybrid teaching research

High Frequency Keyword Network Graph Analysis

Word frequency statistics analysis was carried out on the high frequency keywords, can preliminary findings hybrid teaching research hotspot, because is more, this study selected keywords reason based on keyword frequency in order to determine the high frequency keywords, and statistics in nine times more keywords, these keywords can represent the domestic hybrid teaching basic research hot spot. Table 3 shows the top 20 high-frequency keywords.

Table 3. High frequency keywords

SN	Key fields	Frequency	SN	Key fields	Frequency
1	Blended teaching	659	**16**	Blended teaching environment	13
2	MOOC	108	**17**	constructivism	12
3	Flipped classroom	59	**18**	Education technology	12
4	Teaching mode	53	**19**	Information technology	12
5	SPOC	45	**20**	Classroom teaching	12
6	Online learning	33	**21**	Educational informatization	12
7	Blended teaching model	30	**22**	Internet +	11
8	Teaching design	29	**23**	The remote	10

				education	
9	Teaching reform	25	24	Moodle	10
10	The university English	18	25	Network teaching	9
11	Deep learning	17	26	Higher education	9
12	Mobile learning	16	27	The rain classroom	9
13	Micro-Lectures	15	28	Ideological and political theory course	9
14	Autonomous learning	15	29	Strategy	9
15	Factors affecting	14	30	Teacher training	9

High-Frequency Keyword Co-Occurrence Spectrum

In order to more intuitive to show the connection between the high frequency keywords, the researchers through the network map to reflect the high frequency of key words in the literature of co-occurrence case, using the center degree analysis to express the degree of the connection between the keywords node is larger, the more contact with other nodes at the same time, indicates that the node is in a central position (Freeman, 1978).Figure 3 for the hybrid network teaching research of high frequency keywords co-occurrence graph, known from the figure, in addition to the "Blended Teaching ", contact more keywords, including "MOOC", "Flipped Classroom", "Teaching Mode", "Online Learning", "SPOC", "Blended Teaching Mode " and so on, these keywords for other keywords have stronger control ability, is the core of the domestic research on hybrid teaching keywords.
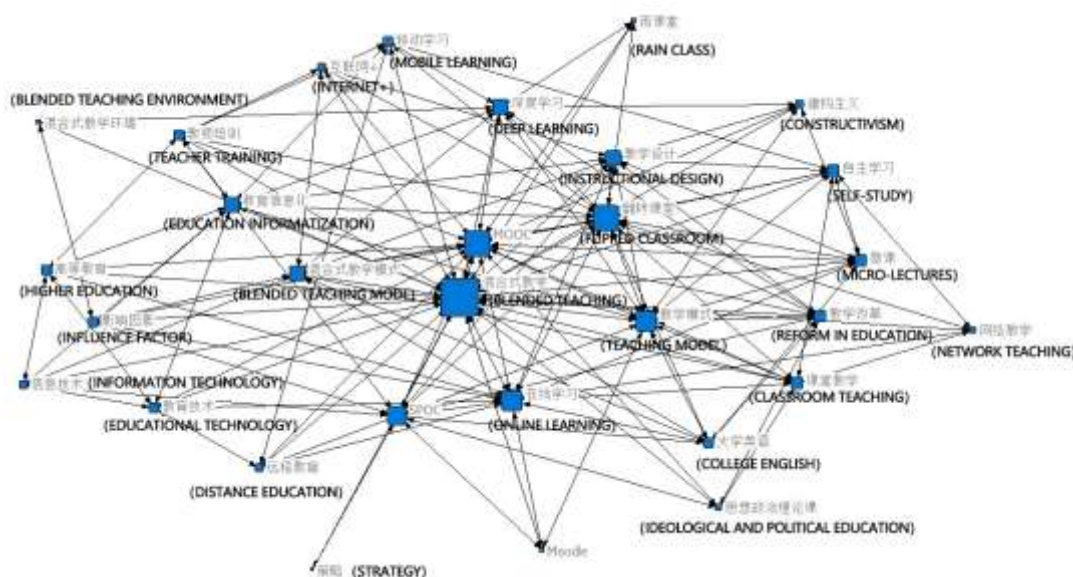

Figure 3. High-frequency keyword co-occurrence network map

Multidimensional Scaling Analysis

Multidimensional scaling analysis is a data analysis method that simplifies research objects in multidimensional space to low-dimensional space for positioning, analysis and classification, while retaining the original relationship between objects. In this paper, SPSS software was used for multidimensional scale analysis. Through multidimensional scale knowledge graph analysis, the knowledge graph of hybrid teaching research in China was obtained, as shown in figure 4. These keyword researches can be roughly divided into three categories. They are: research on the application of teaching mode based on online courses, research on the application field of blended teaching in the context of Internet, research on the construction of blended teaching environment and research on classroom teaching reform based on Blended teaching.
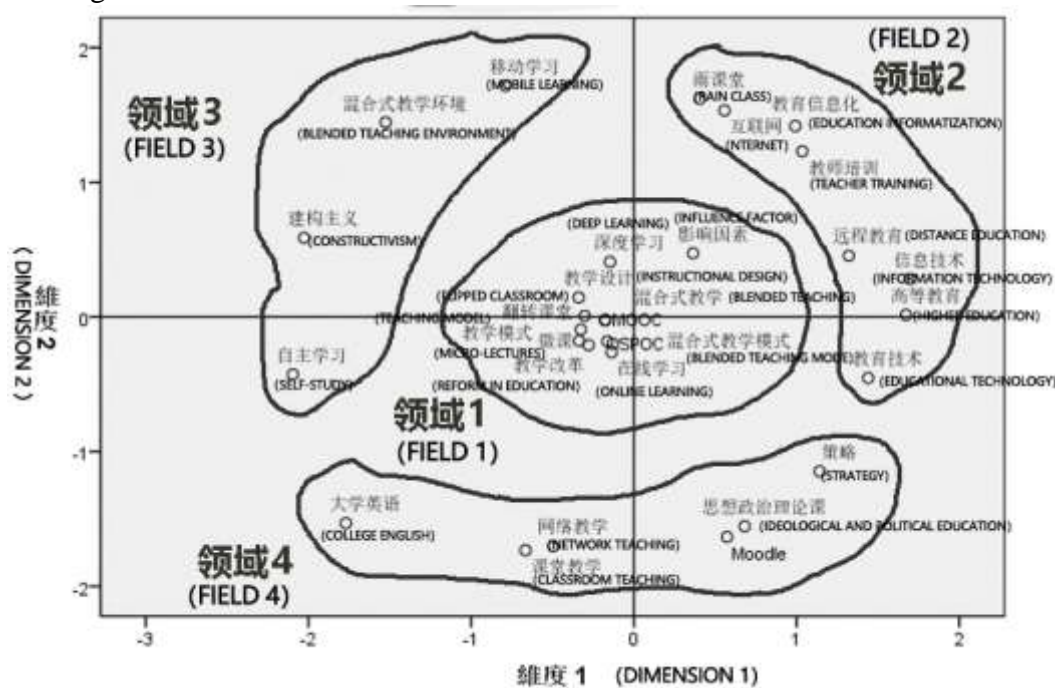

Figure 4. Multidimensional scale map of high-frequency keywords

CONCLUSION

From the perspective of scientific measurement, this paper explores blended teaching based on keyword co-occurrence and social network analysis. The core journal papers of Peking University and Nanjing University in CNKI China's online publishing library are used as data sources. Software such as EXCEL, SPSS and UciNet are used to process the data and draw the corresponding network map.

Mainly to the following conclusion: the study of hybrid teaching in China the

development trend of steady growth, "modern education technology", "China audio-visual education", "electrochemical study of education and distance education in China" and other four journals for hybrid core journals of teaching research, more hybrid teaching research institutions at the same time, the higher normal colleges and universities is the backbone of the hybrid teaching research. At present, Blended teaching in China has formed a certain scale of cooperative groups, and the research content is extensive. "MOOC", "Flipped Classroom", "Teaching Mode", "Online Learning", "SPOC", "Blended Teaching Mode" are the high frequency keywords in this field. The three hot topics of blended teaching are: application research of teaching mode based on online course, application research of hybrid teaching field under the background of Internet, construction research of hybrid teaching environment and research of classroom teaching reform based on blended teaching.

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