

Analysis and Enlightenment of the Present Situation of Rural Distance Education Research in China

PANG Feng

Nanjing Forestry University, Nanjing, China

LU Kaili

Central China Normal University, Wuhan, China

In order to comprehensively and accurately understand the research status of rural remote education in China, find out problems and deficiencies, and make clear the future development direction. This paper used the methods of word frequency analysis, content analysis, and social network analysis to study rural remote education literature. The results showed that the research content in rural remote education mainly focuses on “Rural Remote Engineering”. The researchers are mainly concentrated in the normal university, and there are few studies in cooperation with other institutions. The method of “qualitative and critical” is often adopted in the research methods. The service object of the study focuses on the basic education. This shows that the research content of remote education in rural China is relatively concentrated, the research lacks cooperation and communication, and the research method is relatively single.

Keywords: rural remote education, word frequency analysis, research progress, research status

Introduction

Since 2003, the use of modern remote education to promote the development of rural remote education has attracted the attention of relevant departments of the state in China, and relevant policies have been formulated. Such as in July 2003, the central organization department issued a “rural party cadres modern distance education pilot work plan”, clearly pointed out that with the aid of modern distance education, education and training of rural party members and cadres, in September the same year, the state council held a national work conference on rural education, issued “the decision of the state council on further strengthening rural education work”, decided to clearly put forward “the implementation of modern distance education project of rural elementary and middle schools, promote the high quality education resources sharing between urban and rural areas, and improve the quality and efficiency of the rural education”. In the report of the 18th National Congress of the Communist Party of China, it was also clearly put forward that “strengthening the construction of teachers’ ranks and focusing on improving the quality of rural teachers”, encouraging social forces to start education, developing remote education and continue education, and building a learning society of learning for the whole people and lifelong learning. With the continuous advancement of rural modern remote education work, the research on rural remote education has become an important issue concerned at present.

PANG Feng, M.D., lecturer, Information Center, Nanjing Forestry University.

LU Kaili, Ph.D. candidate, National Engineering Research Center for E-Learning, Central China Normal University.

In recent years, China's research on rural remote education mainly focuses on the modern remote education project of rural primary and secondary schools (hereinafter referred to as the "rural remote engineering"). For example, Yang and Jia (2013) used questionnaire survey and literature analysis to analyze the construction and application status of "rural remote project" in Ningxia region. L. X. Xiao, Chen, and Y. D. Xiao (2015) evaluated and analyzed the current situation of rural remote education by means of investigation. Using the data collected by questionnaire survey and field interview. X. H. Yang, P. Yang, Hao, and Kang (2010) summarized the construction and application status of modern remote education project for rural party cadres in Zhejiang Province.

However, there are few studies on the overall development of rural education in China. In order to get a comprehensive understanding of the current research status of rural distance education in China, this article from the rural distance education research focuses on the content and change, research institutions, research methods, to the service object of study and analysis, in order to make clear the current rural distance education research in China development present situation, to discover the existing problems, to help researchers to grasp the future research direction in this field, and to promote the benign development of the rural distance education.

The Method

In this paper, lexical frequency analysis, content analysis, and social network analysis were used to study the relevant literature of rural remote education. Word frequency analysis is a bibliometric method to determine the research focus and development direction of a certain field by using the frequency level and frequency variation of keywords in a certain period (Ma, Zhou, & Guo, 2009). The key words of the rural remote education paper were quantitatively analyzed to understand the key research content of rural remote education, the content of increasing attention, and the content of decreasing attention. Content analysis is a research method to objectively and systematically quantify and describe the obvious communication content. It is to perform technical treatment on a single sample, decompose the content into several analysis units, evaluate the objective facts displayed by the units, and make quantitative statistical description (Li, 2003). This paper uses content analysis to analyze the research method and service object of rural remote education paper. Social network analysis is a kind of social structure and social relations research methods of sociology, its visual form is a set of points, between point and point of attachment of graphics, among them, the point according to the basic unit of sociological analysis, such as individual, group, or community, feature point refers to features that are characteristic of the unit, between attachment, exist some relationship between said point (Liu, 2004). Through the analysis of the social network of the rural remote education paper, this paper analyzes the relationship between research contents and different types of research institutions. The statistical tools adopted by the institute include Statistic Package for Social Science (SPSS) 19.0, SATI 2.9, and Ucinet 6.0.

Sample from Chinese National Knowledge Infrastructure (CNKI) (see <http://www.cnki.net>), select China outstanding master's dissertations full-text database and Chinese Ph.D. dissertation full text database and seven domestic education technology and the remote education journal papers as sample source, "SU = rural distance education", "SU = far engineering", or "SU = rural modern distance education", the retrieval time for December 31, 2017, a total of the retrieved 253 papers, eliminate meetings, interviews, advertising, and so on do not meet the requirements of this study, a total of 12 papers of obtain 241 valid theses. Among them, 141 journal articles and 100 degree papers were published. The specific distribution is shown in Table 1.

Table 1

Research Paper Statistics

Name	Paper number	Number of valid papers
E-education research	25	25
China educational technology	64	59
Distance education in China	39	34
Open education research	3	2
Modern distance education research	8	7
Modern distance education	12	12
Journal of distance education	2	2
Excellent academic degree thesis	100	100
Total	253	241

Research Status Analysis**Total Paper Analysis**

The distribution of 241 valid articles by year is shown in Figure 1.

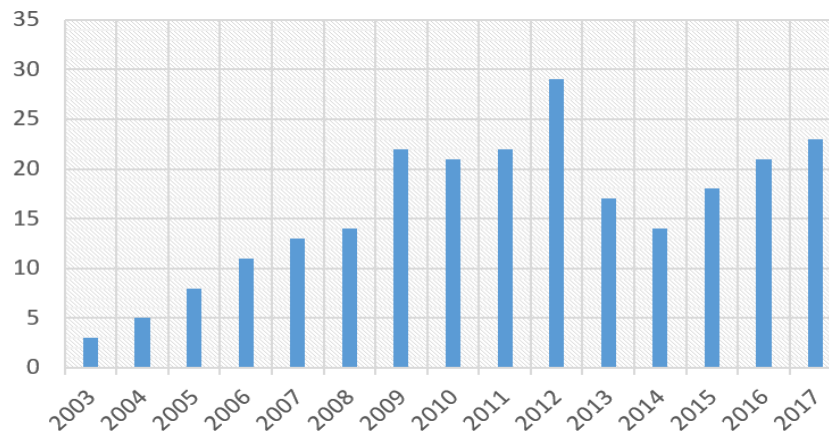


Figure 1. Distribution of research papers.

As can be seen from Figure 1, since the research on rural remote education started in 2003, the research on rural remote education has been developing rapidly. Since 2009, China has ushered in a high tide of research on rural remote education, China is implementing a series of major projects of rural distance education in this period, from 2003 to 2010, The state council proposed the implementation of “Rural Remote Engineering”. Rural primary schools have satellite teaching vision, teaching CD player equipment and complete sets of teaching CD, and rural middle schools have computer classrooms. Since 2004, the Ministry of Education, Ministry of Finance, Ministry of Agriculture, and other departments have jointly implemented “The Sunshine Engineering”. From 2003 to 2012, the Ministry of Agriculture, Ministry of Finance, and other departments implemented the “Trans-Century Young Farmers’ Scientific and Technological Training Project” (Wei & Lu, 2015).

Research Content Analysis

In order to analyze the research content in the rural remote education research field, this study used the literature measurement method to make statistics on the keywords in the paper samples, and then analyzed the statistical results to find the key research content in this research field, the research content with increased

attention, and the research content with decreased attention. The research is carried out based on the following hypothesis: Most keywords in this research field can accurately highlight and summarize the main research content of the paper (Wei, 2010). Therefore, we can analyze the research content by analyzing the keywords and the relationship between keywords.

Based on the frequency of keywords in this paper, the authors find the key content of rural education research. If a study is focused, the more frequently keywords appear, and vice versa. For the frequency of occurrence of large keywords, we call high-frequency keywords.

The authors extracted keywords and eliminated those words with ambiguous expression connotation, such as “research”, “development”, “thinking”, “enlightenment”, etc., counted the frequency of keywords and ranked them by frequency from large to small. High- and low- frequency word threshold is calculated by the formula of high- and low- frequency word threshold proposed by Qinglan Sun¹ (2004), the author selected keywords with frequency not less than five (26 in total) as high-frequency keywords, and the specific situation is shown in Table 2.

Table 2

High-Frequency Keywords

High-frequency keywords	Frequency	High-frequency keywords	Frequency
Rural remote engineering	63	Education informatization	8
Remote education	35	Education project	8
Rural remote education	29	Teaching resources	7
Teacher training	21	Primary and secondary schools	7
Modern remote education	17	Basic education	7
Teaching mode	17	Three models	6
Rural education engineering	15	School training	6
Sustainable development	13	Performance technology	6
Educational strategy	12	Education technology	6
Rural primary schools	12	Teacher professional development	6
Information technology	9	Optimization strategy	5
Rural education	9	Online education	5
Education resources	9	Broadcasting education	5

High-frequency keywords represents the research contents can be regarded as the key research content of the rural distance education in China, “rural remote engineering” and “the sunshine engineering” refer to in the study of rural distance education for the research project; “remote education” and “education technology” refer to the two closely related research areas; “teaching mode” and “educational strategy” refer to the study of teaching; “teacher training” and “teachers’ professional development” refer to the studies of teachers’ professional development; “the education resources”, “teaching resources”, and “three models” refer to the studies of resource construction; and “basic education” and “rural primary schools education” refer to their attention to rural basic education. Other contents, such as “performance technology” and “sustainable development”, are also relatively concerned.

The total frequency was 738. According to the calculation formula of threshold value, select frequency of not less than four keywords as high-frequency keywords. The period from 2003 to 2010 is early and the period

¹ Sun Qinglan proposed the high frequency and low frequency word threshold formula, $T = \sqrt{D}$, T stands for the threshold of high- and low- frequency values, and D is the number of keywords.

from 2008 to 2018 is late. Frequency of standard keywords = (Frequency of keywords/Total) \times 2000.

High-frequency keywords are 29 in the late stage. Low-frequency keywords are 234 in the early stage. The same keywords are six. Standard keywords = Frequency of late-stage standard keywords – Frequency of early-stage standard keywords.

Table 3

Keywords of Rising

Keywords	Frequency of late-stage	Frequency of early-stage	Difference value
Education resources	16	5	11
Teaching application	11	5	6
Online education	11	5	6
School training	14	9	5
Teaching strategy	8	5	3
Three models	8	5	3

“Teaching application”, “online education”, “school training”, “teaching strategies”, and “three models” have been improved. “Education resources” has the highest attention.

High-frequency keywords are 23 in the late stage. Low-frequency keywords are 296 in the early stage. The same keywords are seven. Standard keywords = Frequency of early-stage standard keywords – Frequency of late-stage standard keywords.

Table 4

Keywords of Dropping

Keywords	Frequency of late-stage	Frequency of early-stage	Difference value
Teaching mode	27	5	22
Three models	23	3	20
professional development	23	5	18
Application performance	18	3	15
Learning resources	14	3	11
IP resource	14	3	11
Teacher learning resource	14	3	11

“Teaching mode”, “three models”, “teacher professional development”, and “application performance”, “learning resources”, “application performance”, “learning resources”, “IP resource”, “teacher learning resource” had fallen, and “teaching mode” is most obvious.

Institutional Analysis

The authors only selected 141 journal articles for analysis, and divided the research institutions that publish journal papers into five categories: comprehensive university, normal university, radio university, e-educational education hall, and other institutions (such as primary and middle schools, enterprises, television stations, and government agencies).

The majority of researchers are from normal universities, accounting for 68.8% of the published papers. There are also researches from radio and television universities, accounting for 14.9%. Although a small number of researchers from e-educational education hall, primary and middle schools, television stations, and government agencies participated in the research, but results are less.

In order to understand the relationship between the different types of research institutions, the authors analysis by using social network analysis relations of cooperation, statistical results showed that only comprehensive universities, normal universities, electronic education, radio university, and other institutions have cooperation, and they worked together many times. Other institutions are very few cooperation.

Table 5

Research Institutions Table

Research institutions	Number	Percentage (%)
Comprehensive universities	13	9.2
Normal university	97	68.8
Radio university	21	14.9
E-educational education hall	8	5.7
Other institutions	2	1.4

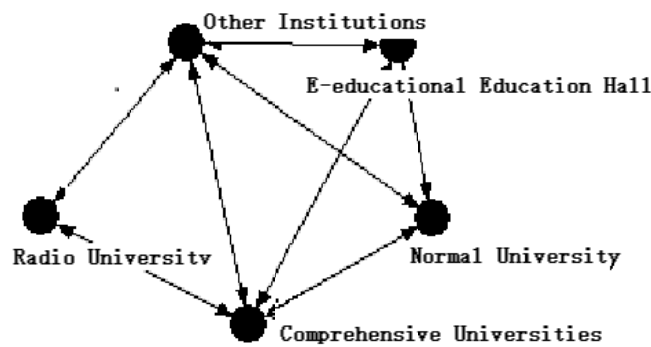


Figure 2. Cooperation network diagram.

Research Method Analysis

The authors analyze the journal articles. This paper refers to the classification of higher education research methods of Xu Hui and Ji Chengjun, divided into two categories: qualitative and speculative, quantitative and empirical. Qualitative and critical thinking is divided into perceptive, historical, comparative, and multidisciplinary, while quantitative and empirical research is divided into survey research, case study, experimental method, and multidisciplinary research (Xu & Ji, 2004). The authors classify it into quantitative and empirical categories.

Table 6

Research Methods Table

Research methods		Number	Percentage (%)	Total	
				Number	Percentage (%)
Qualitative and speculative	Perceptive	89	63.1	103	73.0
	Historical	5	3.5		
	Comparative	4	2.8		
	Multidisciplinary	5	3.5		
Quantitative and empirical	Survey research	21	15.0	38	27.0
	Case study	13	9.2		
	Experimental	2	1.4		
	Multidisciplinary	2	1.4		

In the research field of rural remote education in China, the qualitative and speculative categories accounted for 73.0%, while the quantitative and empirical categories only accounted for 27.0%. This shows that most of the rural remote education studies use qualitative and speculative methods, lacking quantitative and empirical analysis. As for qualitative and speculative research, it mainly focuses on perceptive speculation (63.1%), while in quantitative and empirical research, the main part (15.0 %) is investigated, which indicates that remote education in rural China attaches more importance to the research of perceptive speculation relying on subjective experience.

Service Object Analysis

The research object shows the field of the topic and the scope of the research result. The service object of the study shows the generation and achievement of the research problem (S. G. Li, Sun, & H. M. Li, 2008). This study divided the service objects into basic education, adult education, teacher education, party member education, other education, social organization, and others.

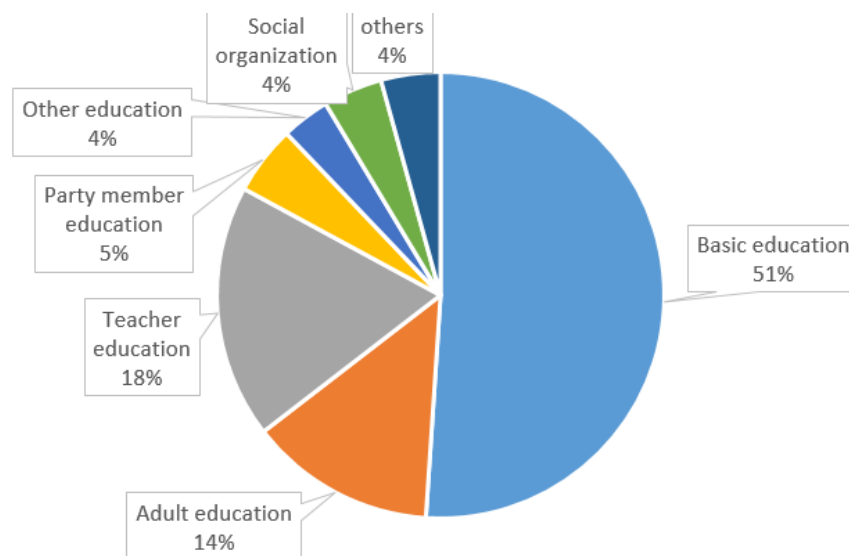


Figure 3. Service object distribution diagram.

Rural remote education research serves basic education with a percentage of 51.1%. Secondly, teacher education accounted for 18.4%. The total percentage of papers serving education objects is 91.5%. The percentage of papers serving social organizations was very small, with a percentage of 4.3%. Research shows that the rural distance education, most of these are related to education, basic education is the focus of attention, the reasons for this phenomenon may be associated with a series of engineering in China, such as modern distance education project of rural elementary and middle schools, rural party cadres modern distance education project, sunshine project for the training of rural labor transfer, and rural primary and middle schools modern distance education project lasted the longest time.

Conclusions and Implications

Since 2003, rural remote education in China has experienced rapid development, especially the modern remote education project in rural primary and middle schools, which greatly promoted the research and practice of rural remote education in basic education. Remote education in rural China is attracting more and

more attention. Through word frequency analysis, content analysis and social network analysis of rural remote education research papers, the following conclusions and implications can be drawn from their research status:

The Research Mainly Focuses on the Rural Remote Engineering, Which Lacks More Extensive Research

Research show that the teaching model, three kinds of mode, teachers' professional development, application performance, learning resources, IP resources, and teacher learning resource center are the core content of the research field, research core change into teaching resources, teaching application, online education, teacher training, teaching strategies, model, however, a research has focused on modern distance education project of rural elementary and middle schools, special education, adult education, and vocational education are the lack of research. Relevant national departments should formulate corresponding policies to encourage researchers to conduct more extensive and in-depth research on rural remote education.

The Research Institutions are Mainly Normal Universities and Radio Universities, Different Types of Research Institutions Lack Communication and Cooperation

Through the analysis of the research institutions, it found that the research institutions are mainly normal universities and radio universities; the research institutions also include comprehensive universities and audio-visual education centers. However, the lack of communication and cooperation between the research institutions may be detrimental to the comprehensive and in-depth development of this field. It is worth noting that excellent dissertation has also taken this field as the research object of choice, which will promote the development of remote education research. In general, relevant researches of different types of research institutions have promoted the research of rural remote education, and strengthening the interaction, collaboration, and cooperation among different types of research institutions may be an important way to further promote the research of rural remote education.

The Research Method is Simple and Lacks Empirical Support

According to the statistical findings of the research methods, researchers mainly adopt qualitative and critical thinking, and sensory critical thinking occupies the most places. Comparative, historical, and multi-disciplinary critical thinking is rarely adopted. In the quantitative and empirical research results, researchers mostly use investigation research and case study, lacking experimental research and multidisciplinary research. Researchers should adopt quantitative and empirical methods to make up for the lack of empirical support in rural education research.

The Service Objects Studied are Mainly in the Field of Education, and Mainly Serve Basic Education

There are many research achievements serving basic education. The reason may be that China pays attention to the development of rural basic education. There are also some research achievements serving teachers education, because teachers' ability is the key factor for the development of basic education. The proportion of adults' education and party member education is relatively small; it is possible that these types of education have not been paid attention by researchers. Therefore, there is great potential for further research on rural remote education. Researchers should actively pay attention to basic education and teacher education, as well as adults' education, party members' education, and others.

References

Li, K. D. (2003). *Education technology research methods*. Beijing: Beijing Normal University Press.

- Li, S. G., Sun, W. H., & Li, H. M. (2008). Content analysis of education excellent master's thesis in technology in the last five years. *E-Education Research*, 177(1), 30-35.
- Liu, J. (2004). *Introduction to social network analysis*. Beijing: Social Sciences Academic Press.
- Ma, Y. H., Yue Zhou, Y., & Guo, J. (2009). The emphasis and evolution of education technology research in China from 2002 to 2008: Analysis and discussion based on word frequency statistics. *China Educational Technology*, 194(6), 14-17.
- Sun, Q. L. (2004). The boundary division of high frequency and low frequency words and the method of word frequency estimation. *Information Science*, 126(4), 28-32.
- Wei, S. P. (2010). Research progress survey and analysis of education technology (remote education) in 2010. *Journal of Beijing Radio and Television University*, 65(5), 24-30.
- Wei, S. P., & Lu, Q. L. (2015). Analysis on the development status and characteristics of rural modern education in China. *Modern Education Technology*, 72(6), 31-33.
- Xiao, L. X., Chen, H., & Xiao, Y. D. (2015). Western rural primary and middle school modern remote education project status evaluation analysis. *Journal of Teaching and Management*, 613(3), 35-37.
- Xu, H., & Ji, C. J. (2004). Status and analysis of higher education research methods. *Higher Education Research in China*, 123(1), 13-15.
- Yang, X. H., & Jia, W. (2013). A study on the evaluation of benefits of modern remote education engineering application in rural primary and middle schools from the perspective of stakeholders. *E-Education Research*, 246(10), 52-57.
- Yang, X. H., Yang, P., Hao, J. H., & Kang, C. (2010). Research on construction and application of modern remote education project for rural party cadres in Zhejiang Province. *E-Education Research*, 202(2), 56-60.