

# Preschool Bilingual Teachers' Research Hotspot Based on Co-word Clustering and Multi- dimensional Scale Analysis --123 Chinese Documents from 2003 to 2017

Luyi Jiang and Xiaohan Ye  
East China Normal University, Shanghai, China  
Email: {443177056, 514469595}@qq.com

**Abstract**—Bilingual education of young children is one of the international research hotspots. As a world's most populous nation, China has done abundant research on this topic and pay more attention on the teachers. This study collected 123 valid documents in the full-text database of CNKI. Based on the overall situation analysis of the published documents in the past years, the keywords were analyzed with respect to frequency, co-occurrence, co-word clustering and multidimensional Scale. Combing with the above results, the research classifies research hotspots into four categories: (a) Research on the development of professional competence of pre-school bilingual teachers; (b) Research on teacher training for pre-school bilingual teachers; (c) Research on bilingual teachers in ethnic minority areas; (d) Research on teaching strategies of pre-school bilingual teachers. Based on the above research, this study puts forward the important tasks of current research and future research trends in order to provide some ideas for follow-up research.

**Index Terms**—Pre-school bilingual teachers, research hotspots, co-word clustering, multidimensional scaling

## I. QUESTION RAISED

In China, pre-primary bilingual education is that teachers use the first language and the second language at the same time or in intervals to organize children's theme education activities, game activities, and daily activities in the kindergarten's daily education and teaching environment. Its purpose is to both enlighten children and attract their interest for the second language on the basis of the development of their children's mother tongue, and to allow children to contact and experience multiple cultures as well as acquire two languages, laying the foundation for their development in a multicultural society [1]. The contents mainly include: 1) Chinese children of Han ethnic group learn second or third languages other than Mandarin, such as English, Japanese, Korean, etc.; 2) Chinese minority children learn Chinese; 3) Foreign children who live in China need to learn Chinese because of their parents' work, such

as young children from countries such as Singapore, the United States, and South Korea. Results of survey on bilingual kindergarten teachers in 24 provinces and cities in China [2] reveal that teachers of pre-primary bilingual education in China are mainly divided into three categories: 1) Teachers who graduated from preschool education, although such teachers have certain pre-school education knowledge, skills, and experience, there are deficiencies in the grammar, phonetic sound, spoken English and other aspects. 2) Teachers who graduated from the English majors or professional colleges, although such teachers have professional English language skills, they lack professional knowledge and skills in preschool education. Teaching content, forms, and methods may not be suitable for young children's physical and mental development; 3) Foreign teachers, although popular with parents and young children, complex professional background (most are not preschool majors), varying levels of teaching, mobility and randomness are their characteristics, nor do they have uniform assessment and appraisal mechanism.

Facing the complex situation of current pre-school bilingual teachers, Chinese researchers have conducted extensive research on this issue from multiple perspectives. What are the focuses of the current research hotspot? What are the future development trends? In this study, a common word clustering method was used to map the knowledge.

## II. RESEARCH METHOD

### A. Data Sources and Processing

Till August 2017, the study has used subject headings as preschool/ kindergarten/ infant bilingual teachers/teachers/professionals/courses/training to sequentially search in the CNKI full-text database, and a total of 197 articles related to pre-school bilingual teachers were retrieved. To ensure the validity of the data, the following articles were selected in this study: (1) duplicated literature; (2) meetings, newspapers, and other literature; (3) articles with little relevance to the topic. Finally, 123 valid data were obtained.

---

Manuscript received August 27, 2018; revised November 1, 2018.

### B. Research Tools and Methods

In this study, Bicom 3.2 co-word analysis software and SPSS 21.0 statistical software were used to conduct word frequency analysis and co-word cluster analysis. Among them, word frequency analysis, by counting the frequency of the keywords covering the main content of the literature in the literature of a certain research field, infers research hotspots and development trends in the field [3]. Co-word clustering, which is based on word matrix, performs correlation calculation and will be closely related. The key words are clustered together to determine various research hotspots [4]. The

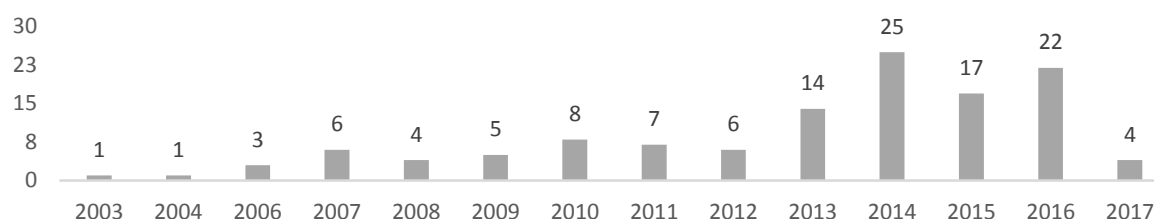


Figure 1. The number of previous years of pre-school bilingual teacher research

In the past 15 years, the number of documents related to pre-school bilingual teachers has been 123, including 112 periodicals (published from 2003/1 to 2017/8) and 11 dissertations (published from 2007/1 to 2017/8). The first periodical paper "Inquiry for Bilingual Teacher Training Models in Young Children" was published in 2003, and the first dissertation "Studies on Teacher Training for Pre-school Bilingual Teachers in Five-year Colleges and Universities" was published in 2007. According to the number of documents in each calendar year, 2012 and 2013 can be regarded as the watershed: (1) 2012 (including 2012) is the initial period of development. A total of 41 documents have been published, accounting for 33.33% of the total number of documents; (2) Above 2013 (Include 2013) As a period of rapid development, as of August 2017, a total of 82 documents were published, accounting for 66.66% of the total number of documents. It can be seen that after 2013, the number of pre-school bilingual teachers has soared and peaked in 2014 (25 articles), showing a trend of fluctuating growth.

### B. Frequency Analysis

According to statistics, 123 documents contain a total of 270 keywords, with a cumulative frequency of 493. However, due to different expression habits, there are many synonyms in the keywords. In order to better statistically correlate the results, the study synthesizes synonymous keywords, that is, they are modified into the same noun. Among them, other competencies refer to professional skills other than teaching and speaking skills, such as the skills of simple strokes, basic skills, and communication skills. In this way, 75 keywords were collected and the frequency was between 1-53. Among them, there were 38 keywords with more than 3 times of frequencies.

These 38 keywords appeared 444 times in these articles, accounting for 60.85% of the total frequency of keywords. The first 15 keywords appeared more than 10

multidimensional scale analysis method is a spatial expression of the distance relationship between keywords so as to realize the function of localization and categorization analysis [5].

## III. RESEARCH RESULTS AND ANALYSIS

### A. Overview of Research Over the Years

The 123 articles related to pre-school bilingual teachers were published from 2003 to 2017. The number of documents published each year is shown in Fig. 1.

times in frequency, followed by pre-school bilingual teachers (53), bilingual education (43), teacher language level (32), ethnic minority areas (28), pre-school education (23), bilingual teacher training (22), training methods (18), bilingual teachers (15), teaching methods and strategies (14), universities and students (13), teaching ability (12), status quo and Question investigation (11 times), teacher professional development level (11 times), curriculum setting (10 times).

### C. Co-occurrence of Hot Key Words

The so-called co-occurrence refers to the situation where two vocabularies appear in the same article at the same time [6]; Co-occurrence matrix is Used to represent the co-occurrence times of two or two keywords. In this study, a 75\*75 co-word matrix was calculated using Bicom software. There were 8 pairs of words that co-occurred more than 10 times in frequency.

It was found that vocabulary such as pre-school bilingual teachers and teachers' language proficiency, ethnic minority areas, bilingual teacher training, and teacher professional development level are frequently used together; teacher language level and pre-school bilingual teachers, colleges and students, bilingual teaching, and teaching activities. The co-occurrence frequency of such vocabularies was higher; vocabularies such as ethnic minorities and preschool bilingual teachers and bilingual education appeared frequently.

### D. Co-word Cluster Analysis

In this study, the top 19 vocabularies with a frequency of more than 8 times (a total of 19, accounting for 71.4% of the total number of keywords) were selected for co-word cluster analysis, and the Bicom co-word analysis software was used to generate the metric matrix. Then import SPSS for cluster analysis, and eventually converge into three major types. The specific results are shown in Fig. 2.

Co-word clustering statistics show that the first type of clustering results include quality assessment, teaching activities, professional development level of teachers, other abilities, curriculum setting, status quo and problem investigation, colleges and universities, students, and teaching ability; The results of the second class of clustering include teaching methods and strategies, bilingual teaching, and teachers' language level; the third clustering results include training methods, bilingual teachers, bilingual teacher training, preschool education, ethnic minority areas, bilingual education, and preschool bilingual teachers.

#### E. Multi-dimensional Analysis

To further clarify the situation, in the top 19 vocabularies of this study, three vocabularies with little meaning, such as pre-school bilingual teachers, bilingual education, and preschool education, were removed, and the remaining 16 vocabularies (of the total number of keywords were 47.21%) The multidimensional scale analysis was performed. The specific results are shown in Fig. 3.

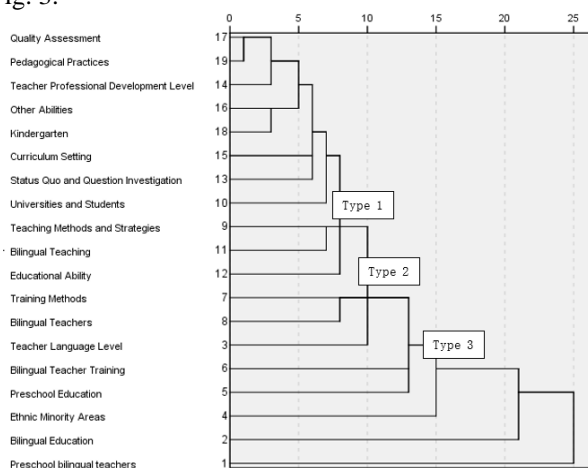


Figure 2. Co-word clustering tree

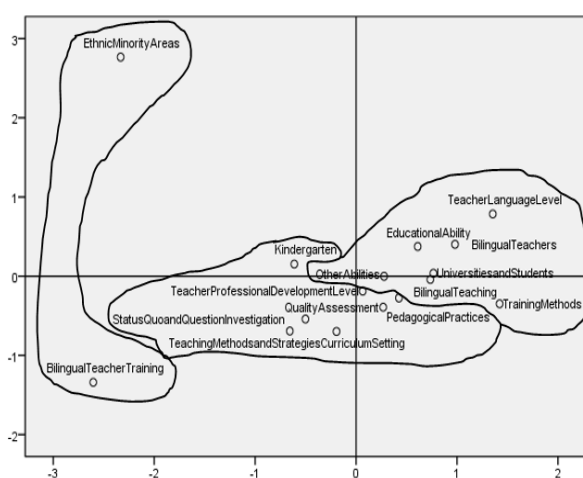


Figure 3. Multidimensional scale analysis

#### IV. DISCUSSION AND CONCLUSION

In summary, the development of pre-school bilingual teachers in China is at a preliminary stage of

development. After 2013, the number of studies has shown a significant increase in volatility. At present, the research hotspots for pre-school bilingual teachers in China involve four aspects:

Firstly, professional development, curriculum setting and quality assessment. In terms of professional competence, the study proposes that the professional competence of pre-primary bilingual teachers should include bilingual language level, basic theory of preschool education, design of teaching activities and organizational ability, and practical ability from the perspective of both theoretical and practical perspectives. It is difficult to master bilingualism at the same time. Language ability and teaching ability are the current major bottlenecks.

Secondly, bilingual teaching strategies. This kind of research mainly explores the specific forms of various types of activities, existing deficiencies, and effectiveness of teaching strategies in light of different teaching theories, status surveys in specific regions, and quality assessment.

Thirdly, teacher training. Pre-employment training mainly focuses on the suitability of various types for colleges and universities such as curriculum setting, training programs, training modes, and teaching materials design. The number of post-employment training studies is relatively small, focusing on forms such as new teacher induction training, kindergarten internal practice training, and teaching and research. The shortcomings of these trainings are unanimously manifested as a lack of uniform training objectives and competency standards, a scientific curriculum system, and an effective evaluation system.

The fourth, the study of bilingual teachers in ethnic minority areas mainly includes 1) the discussion of countermeasures based on current research; 2) exploring the path of professional development of teachers from different career stages, especially focusing on new accreditation stages; 3) analysis of training needs on the basis of regional differences; 4) specific training content and methods in minority areas; 5) qualification and admission requirements for qualified bilingual teachers.

In the future, Chinese researchers may continue to address the following three issues:

Firstly, to solve the problem of teacher resources and quality in minority areas. China is a multi-ethnic country with a large demand for bilingual teachers in ethnic minority areas. The government has invested a lot of money and issued documents requiring teachers to teach their own language and Chinese at the same time, consolidating national unity and meanwhile promoting coordinated development among regions. Nearly 40% of the literature studies preschool bilingual teachers in minority areas.

Secondly, to establish a set of national qualification standards for pre-primary bilingual teachers and standardize the teaching team to ensure the quality of bilingual education. This will help solve the problem of mixed quality of education and management systems in the three co-existing status of Chinese bilingual

kindergarten teachers (teachers of the kindergarten, foreign English teachers, and foreign teachers).

Thirdly, it is necessary for teachers to establish the correct educational philosophy of pre-primary bilingual education. Apart from language learning, they are also required to pay attention to the cultural value behind. Researchers rarely pay attention to the cultural conflicts behind the two different languages. The frequency of culture only accounts for 0.45%. It should be noted that language is not only a communication tool, but also one of the carriers that carry different concepts, modes of thinking, traditional customs and historical culture. It can play an important role in the development of innovative thinking and problem solving skills on the basis of expanding children's horizons. It is an inevitable trend to further study the competence structure of pre-school bilingual teachers based on a cultural perspective and incorporate them into the conditions for qualification entry.

#### REFERENCES

- [1] N. Sha, Y. Mei, and D. Xiuping, "The study of hot topics of instructional design based on word frequency analysis and co-word clustering," *Modern Educational Technology*, vol. 3, pp. 31-35, 2013.
- [2] S. Xuemei and Z. Fang, "Preschool bilingual education teacher specification standards and its professional development approach," *Preschool Education Research*, vol. 5, pp. 39-44, 2010.
- [3] W. Binhua, "Chinese and foreign comparisons: Definition, attributes, and purposes of bilingual education," *Educational Development Research*, vol. 6, 2005.
- [4] W. Liying, *Theory and Practice of Bilingual Education: A Comparative Study of Chinese and Foreign Bilingual Education*, Shanghai: Shanghai Education Press, 2008, p. 15.
- [5] Z. Jie and W. Hong, "Based on word frequency analysis and visualization of co-word network map contrastive analysis of

mobile learning research hotspots at home and abroad," *Modern Distance Education*, vol. 2, pp. 76-83, 2014.

- [6] Z. Weijin, L. Jia, and Y. Xingju, "Co-word analysis research (3) - Principles and characteristics of co-word clustering analysis method," *Journal of Information*, vol. 7, pp. 118-120, 2008.



**Luyi Jiang** was born in Zhejiang Province of China on 22th December, 1989. Her educational background as followed: (1) 2009-2013, studied at Zhejiang Normal University in Hangzhou, China and obtained a bachelor's degree in preschool education. (2) 2013-2016, studied at the East China Normal University in Shanghai, China and obtained a master's degree in preschool education. (3) 2016-present, studying at East China Normal University in Shanghai, China and receiving a doctorate program in preschool education. Her major field is preschool education. As a student, she published one book and ten articles. The major books and articles as listed: (1) Observation and Analysis of Children's Behavior from The Perspective of The Zone of Proximal Development (Shanghai, China: Juveniles and Children's Publishing House, 2017). (2) Bibliometric Analysis of Development Situation and Trends on Chinese Toys (Journal of Shaoyang University (Social Science Edition), vol. 14, no.6, pp.110-120 October 2015). (3) A study of the Status Quo of 3-6 Year Old Children's Metaphor Comprehension (Early Childhood Education (Educational Sciences), no.9, pp. 46-50, September 2013 ). Now her research interests is the preschool education evaluation.



**Xiaohan Ye** was born on 25th, September in Jiangsu Province, China. Her educational backgrounds are as followed: (1) 2007.9-2011.7. Shanghai Normal University. Majored in English Bachelor Degree (2) 2012.9-2015.3. Shanghai International Studies University. Majored in Adult Learning and Education. Master Degree. (3) 2015.9-2016.9. University of Glasgow. Majored in Teaching Adults. Master Degree. (4) 2017.9- now. East China Normal University. Majored in Lifelong Learning and Education. PhD student.