

## Original Paper

# Analysis of Temporal Distribution, Research Power and Hot Topics of Physical Education Curriculum Research in Chinese Colleges and Universities

Tingting Zeng<sup>1,a\*</sup>

<sup>1</sup> East China Jiaotong University-college of physical education and health, Nanchang, Jiangxi, Peoples R China

\* Tingting Zeng, E-mail: zengting1244181486@qq.com

Received: March 20, 2023

Accepted: April 12, 2023

Online Published: April 18, 2023

doi:10.22158/wjer.v10n2p79

URL: <http://dx.doi.org/10.22158/wjer.v10n2p79>

### **Abstract**

*With the help of Cite Space software and data statistical analysis tools, the research employed bibliometric method and co-word analysis method to analyze the research on physical education curriculum in Chinese colleges and universities, which was included in CNKI from January 1, 1984 to December 31, 2022, in order to grasp the characteristics of its temporal distribution, research power, and hot topics. The findings showed that the research on physical education curriculum in Chinese colleges and universities had gone through a slow formation period, an initial growth period, a rapid growth period, and is currently in a mature and stable period in terms of temporal distribution. However, in terms of research power, there were lack of high-impact research institutions and researchers in China. Furthermore, the hot topics mainly focus on the reform of the physical education curriculum, teaching reform, ideological and political education, and resources in the physical education curriculum of the colleges and universities. Therefore, the research suggests that the further research is required to expand the ideas, methods, breadth, and depth, in order to promote the comprehensive and in-depth reformation and development of physical education curriculum practice in Chinese colleges and universities.*

### **Keywords**

*colleges and university physical education curriculum, Cite Space, bibliometric method, co-word analysis method, research hot-spots*

## 1. Introduction

The physical education curriculum of colleges and universities refers to the overall planning and design of the time limits, processes, and exercise methods of the physical education and activity curriculum provided by colleges and universities for their students, which can be chosen by the students themselves, as well as the physical education quality and health standards that the students try to achieve in the higher education stage (Zhang, 2000). The physical education curriculum of colleges and universities is also an important means to achieve the purpose of education and plays an important role in the process of talent training, social services, scientific research, and the promotion of cultural inheritance. Chinese scholars have conducted valuable research on the physical education curriculum and teaching of the colleges and universities, mainly focusing on the reform of the physical education curriculum, teaching reform, ideological and political education, and resources in the physical education curriculum of the colleges and universities. These studies have contributed to the development of a more comprehensive and advanced research system for the physical education of colleges and universities. As for the systematic review of university physical education curriculum research, scholars in the past mainly adopted artificial and qualitative division basis. However, under the background of globalization and the wave of development of knowledge economy, the rapid development of networking, informatization and data, the emergence, development and popularization of scientometrics and visualization analysis have put forward new requirements for the scientific and systematic research of physical education curriculum in Chinese colleges and universities. Among them, Cite Space is widely used for visualization and analysis of various knowledge fields at home and abroad with its characteristic of “one picture can show the spring and autumn at a glance; one picture is better than ten thousand words, it is clear at a glance” (Li et al., 2016). Based on this, the study attempts to use Cite Space software to conduct a quantitative research on the physical education curriculum research in Chinese colleges and universities to grasp its time distribution, research power and hot topics as a whole, so as to promote the comprehensive and in-depth reform and development of physical education curriculum practice in Chinese colleges and universities.

## 2. Data Sources and Research Methods

### 2.1 Data Sources

In this study, the research sample for physical education curriculum in Chinese colleges and universities were obtained from the CNKI Chinese database using the search term “physical education curriculum of colleges and universities” and a time span from January 1, 1984 to December 31, 2022. After excluding irrelevant documents such as “notice” and “introduction”, 3087 relevant documents were identified.

### 2.2 Research Methods

#### 2.2.1 Bibliometric Method

We conducted an analysis of Chinese university physical education curriculum research using

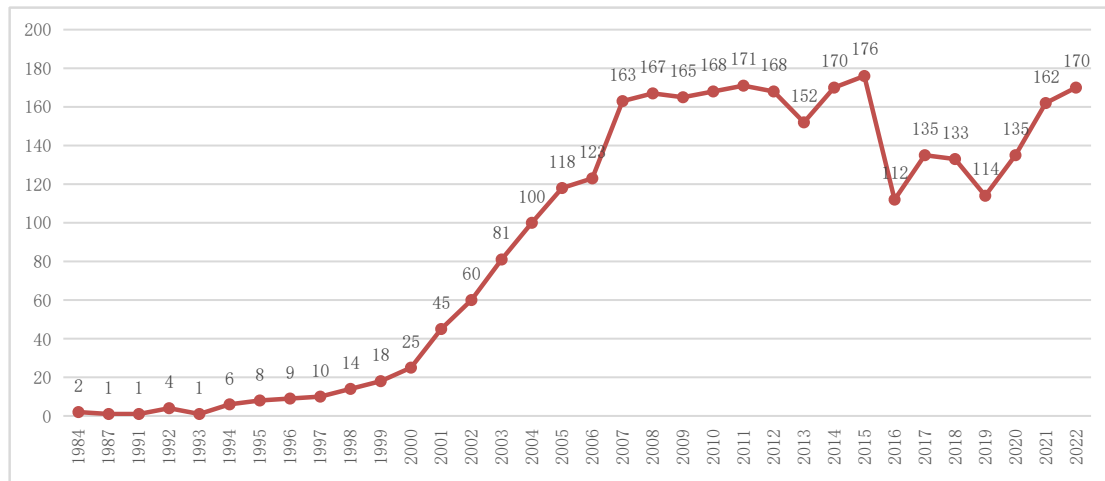
bibliometric analysis method, BICOMB2.0 and Cite Space software. Through the analysis of the co-occurrence of keywords, we extracted and mapped the research topics and keywords of university physical education curriculum to generate relevant data and mapping results. Using this data and mapping results, we identified the hot spots, problems, and frontier areas of university physical education curriculum research by combining research practice and related literature.

### 2.2.2 Co-Word Analysis

The keyword co-occurrence analysis is a statistical method that clusters groups of words that frequently appear together in research literature, which can reveal the structural changes in disciplines and topics, identify frontier hotspots, and predict development trends in the field (Huang et al., 2019). Keyword co-occurrence frequency directly reflects research hotspots, meaning that closely connected keywords are more likely to be hotspots. Therefore, in this study, we will use the co-occurrence analysis method to analyze the keywords of Chinese university physical education curriculum research and examine the connections between keywords, research hotspots, and their changing trends in a scientific manner.

## 3. Temporal Distribution of Physical Education Curriculum Research in Chinese Colleges and Universities

Literature serves as the primary information carrier, and its temporal evolution pattern closely correlates with the development rate of disciplines and research activities (Zhang et al., 2018). Figure 1 illustrated the trend of CNKI publication volume changes of physical education curriculum research in Chinese colleges and universities. From Figure 1, it was apparent that during the ten-year span from 1984 to 1999, the number of annual articles published in physical education curriculum research of colleges and universities was minimal, not exceeding twenty. This indicated that the physical education curriculum research of colleges and universities had not yet received the attention of the academic community during this period, marking the “slow formation period”. Between 2000 and 2006, as the Communist Party and the State increasingly emphasized it, policy documents guiding its reform and development were issued one after another. Consequently, the research process of physical education curriculum of colleges and universities accelerated, and research results grew rapidly, with approximately 20 new articles published each year. This stage can be called the “initial growth period”. During the period between 2007 and 2015, there was a significant increase in the number of articles published in physical education curriculum of colleges and universities. This rise was followed by a period of stabilization at around 160 articles, indicating a steady trend in research results. Therefore, this period can be called the “period of rapid growth”. After 2015, even though the heat of physical education curriculum research of colleges and universities decreased and the number of research articles began to decline, it still maintained a high development trend. This indicates that after more than 30 years of development, Chinese university physical education curriculum research had entered a “mature and stable period”.



**Figure 1. Time Distribution Characteristics of CNKI Articles Volume in Research on Physical Education Curriculum in Chinese Colleges and Universities**

#### 4. Research Power of Physical Education Curriculum Research in Chinese Colleges and Universities

Research power refers to the researchers in a field and the institutions or organizations where they work (Fan, 2018). For physical education curriculum research of colleges and universities, research power can be defined as the researchers involved in this field and the institutions or organizations where they work. Thus, the current study quantitatively analyze literature on university physical education curriculum published in CNKI since 1984 to identify the main research institutions and their researchers in Chinese university physical education curriculum research.

##### 4.1 Research Institutions

A research institution is an institution or organization composed of several people who conduct research around a subject area (Zhang et al., 2019). Table 1 presented research institutions that have published over 10 articles. However, despite over three decades of development in university physical education curriculum research, there were lack of specialized research institutions focusing on the systematic study of this field. The number of publications from research institutions in Chinese university physical education curriculum research is low overall. In terms of the nature of these institutions, comprehensive universities with physical education colleges are the main publishers of physical education curriculum research of colleges and universities, while specialized physical education colleges are relatively rare. The College of Physical Education at Hunan Normal University and the School of Physical Education and Sports Science at China University of Mining and Technology are tied for first place with 15 publications, followed by Xi'an Physical Education University, School of Physical Education and Sports Science at Guangdong Peizheng College, and College of Physical Education at Yangzhou University, each with 14 articles. There are five research institutions with 12 articles, four with 11 articles, and five with 10 articles. It can be seen that there is

not much difference between the number of articles issued by various research institutions, which indicates that the research institutions of physical education curriculum research of colleges and universities in are relatively scattered and lack of high-impact research institutions.

**Table 1. Statistical Table of Research Institutions with More Than 10 Publications**

Number	Institution	Paper
1	College of Physical Education-Hunan Normal University	15
2	School of Physical Education and Sports Science-China University of Mining and Technology	15
3	Xi'an Physical Education University	14
4	School of Physical Education and Sports Science-Guangdong Peizheng College	14
5	College of Physical Education-Yangzhou University	14
6	School of Physical Education and Sport Science-Nanjing Normal University	13
7	College of Physical Education-Qiqihar University	12
8	College of Physical Education-Soochow University	12
9	School of Physical Education and Sport Science-Fujian Normal University	12
10	Department of Physical Education-Anhui University of Technology	12
11	Shanghai University of Sport	12
12	College of Physical Education-Anhui Normal University	12
13	College of Physical Education and Sports Science-Nanjing Tech University	11
14	College of Physical Education-Zhengzhou University	11
15	College of Physical Education-Anhui University of Finance and Economics	11
16	Department of Physical Education-China Pharmaceutical University	11
17	College of Physical Education-Henan Normal University	10
18	Department of Physical Education-Dongbei University of Finance and Economics	10
19	College of Physical Education and Sports Science-Jiangsu University of Science and Technology	10
20	Beijing Sport University	10

#### 4.2 Researchers

The number of articles published by researchers on university physical education programs is one of the main criteria to measure the strength of their research on school physical education policy (Shi et al., 2017). The data were imported into Cite Space, the time slice was set to “3 Years Per Slice”, the node type was selected as “author”, and the node threshold was set to “top50% per slice”, run the software to get the co-occurrence graph of authors in Chinese university physical education curriculum research, and based on the threshold calculation formula of the number of core authors’

publications  $m = 0.749 \times \sqrt{n_{\max}}$  ( $n_{\max}$  for the authors with the highest number of publications) (Ren

et al., 2019), the authors with more than 4 publications were exported to get the statistical table of core researchers in university physical education curriculum as shown in Table 2. Overall, the number of core authors in the field of Chinese university physical education curriculum research is 51, which is a high number. Specifically, Wang Lin has the largest number of research outputs with 14 articles, and his main research is on two aspects of university physical education curriculum content setting and university physical education curriculum construction. Qian Jie has the second highest number of articles, with 9, and his research interests in this field are evaluation of university physical education curriculum and university physical education curriculum reform. Yu Kehong (9), on the other hand, conducted a series of researches on university physical education curriculum model. In addition, Wu Yandan (8), Jiang Li (8), Lian Zhining (7), Yu Xiaodong (6) and Zhang Jinsong (6) have also conducted a series of researches on the reform of university physical education curriculum.

**Table 2. Statistics of Core Researchers of Physical Education Curriculum Research in Chinese Colleges and Universities**

number	researcher	paper number	researcher	paper number	researcher	number		
1	Wang Lin	14	18	Zhang Shuwei	5	35	Yu Hao	4
2	Qian Jie	9	19	Zhang Hongtao	5	36	Huang Niannan	4
3	Yu Kehong	9	20	Cao Yuan	5	37	Wu Long	4
4	Wu Yandan	8	21	Gong Jiangyong	5	38	Zhou Xuerong	4
5	Jiang Li	8	22	Wang Chenmin	4	39	Liu Bin	4
6	Lian Zhining	7	23	Lin Li	4	40	Zhang Kaifei	4
7	Yu Xiaodong	6	24	Jiang Tongren	4	41	Liu Jun	4
8	Zhang Jingsong	6	25	Yu Chunyan	4	42	Feng Weirui	4
9	Li Xiaoli	5	26	Zhang Hongcheng	4	43	LiuKe	4
10	Xu Lan	5	27	Xie Dongxing	4	44	Wang Zhiqiang	4
11	Liu Lu	5	28	Zhang Shuwei	4	45	Xue Yuxing	4
12	Wang Chenmin	5	29	Zhang Hongtao	4	46	Dai Wanlei	4
13	Lin Li	5	30	Cao Yuan	4	47	Chen Jinbo	4
14	Jiang Tongren	5	31	Gong Jiangyong	4	48	Jiang Linlin	4
15	Yu Chunyan	5	32	Sen Laibing	4	49	Xu Yan	4
16	Zhang Hongcheng	5	33	Li Gang	4	50	Zheng Zhongbo	4
17	Xie Dongxing	5	34	Cao Xiaofen	4	51	Cao Qingrong	4

## 5. Hot Topics of Physical Education Curriculum Research in Chinese Colleges and Universities

### 5.1 Analysis of High-Frequency Keywords of Physical Education Curriculum Research in Chinese Colleges and Universities

Keywords serve as a condensed and distilled expression of the core of the article, and their frequency of occurrence reflects the enthusiasm for the research topic (Shi et al., 2017). Based on Price's scientific law, the high-frequency keyword threshold  $m = 0.749 \times \sqrt{n_{\max}}$  ( $n_{\max}$  was for the keyword with the highest frequency) has been established as 20 times for physical education curriculum research in Chinese universities. Consequently, we identified 43 high-frequency words with keyword co-occurrences greater than 20. Due to space limitations, this study only presents the top 20 keywords in terms of frequency of occurrence (as shown in Table 2). It is important to note that the present study did not conduct an in-depth exploration of its keyword frequency statistics given the broad scope of university physical education curriculum research. From the frequency statistics, The word "reform (238)" appeared most frequently, with a count of 238, and the frequency of other keywords related to reform such as "curriculum reform (161)" and "teaching reform (139)" were also high, indicating that the research on Chinese university physical education curriculum primarily focuses on the reform in this field. Additionally, high-frequency words such as "physical education teaching (148)", "undergraduate (100)", "teaching model (96)", "curriculum provision (75)", "quality-oriented education (68)", "lifelong sport (62)", and "feasibility (60)" are also hot research areas. In terms of centrality, Physical education and physical education curriculum occupy a central position, playing a crucial role as a "bridge" and "hub" in the research on Chinese university physical education curriculum, thus indicating that the research in this field mainly focuses on these two.

**Table 3. Statistics Analysis of High Frequency Words in Physical Education Curriculum Research in Chinese Colleges and Universities**

Number	Keyword	Frequency	Centrality
1	physical education curriculum	743	0.54
2	colleges and universities	574	0.13
3	colleges and universities sports	429	0.28
4	regular HEIs	333	0.23
5	sports course	260	0.15
6	reform	238	0.06
7	curriculum reform	161	0.1
8	physical education teaching	148	0.54
9	teaching reform	139	0.05
10	undergraduate	100	0.07

11	teaching model	96	0.06
12	public physical education	90	0.01
13	curriculum provision	75	0.09
14	outward bound	75	0.06
15	curriculum	75	0.01
16	public physical education curriculum	71	0
17	quality-oriented education	68	0.13
18	pe curriculum reformation	66	0.06
19	lifelong sport	62	0.15
20	feasibility	60	0.04

### *5.2 Cluster Analysis of Hot Topics of Physical Education Curriculum Research in Chinese Colleges and Universities*

To gain a more comprehensive understanding of the relationship between high-frequency words and popular research topics in physical education curriculum in Chinese universities, this study utilized clustering analysis on keywords commonly found in physical education curriculum research in Chinese universities. Cluster analysis is a powerful method for reducing the dimensionality of data and grouping similar entities together (Ren et al., 2019). Based on it, using the “LLR” algorithm, this study extracted naming labels for clusters based on high-frequency words in Chinese university physical education curriculum research, resulting in a topic clustering map. By analyzing the literature information and distribution of high-frequency words within the map, the study consolidated the original 21 clusters into four main topics: university physical education curriculum reform, university physical education teaching reform, university ideological and political education in physical education curriculum, and university physical education curriculum resources.

#### *5.2.1 Research on Physical Education Curriculum Reform of Colleges and Universities*

In this cluster, several scholars have conducted extensive research on issues related to university physical education curriculum, including its problems, influencing factors, and potential countermeasures. For instance, Zhang Lu investigated the teaching reform of public physical education curriculum in Shanxi Province and identified issues such as unreasonable curriculum design, low teaching standards, and inadequate course assessments. Based on this analysis, Zhang proposed improvement strategies to optimize curriculum design, enhance the teaching ability of physical education teachers, and strengthen teacher development (Zhang et al., 2020). Meanwhile, Xu Tao highlighted the current challenges facing the reform of university physical education curriculum, such as the lack of social and humanistic elements, insufficient educational and entertainment value, and limited teaching effectiveness. In response, Xu proposed an implementation approach for university physical education curriculum reform, emphasizing the advantages of leisure sports (Xu et al., 2013).



Furthermore, some scholars also adopted an international perspective to enrich the content of Chinese university physical education curriculum research by drawing upon the strengths and weaknesses of foreign research. For example, Yin Lin examined the reform of Japanese university physical education curriculum and proposed that Chinese university physical education curriculum reform should focus on updating reform concepts, strengthening reform efforts, and deepening reform systems (Yin, 2013).

#### 5.2.2 Research on Physical Education Teaching Reform of Colleges and Universities

Physical education teaching reform and curriculum reform in colleges and universities are closely interlinked. The relationship between the two involves theoretical and practical aspects, as well as general and specific considerations. In essence, physical education teaching reform is a crucial element and an integral part of the overall project of physical education curriculum reform. Chinese research on physical education teaching reform primarily focuses on two areas: physical education teaching content and physical education teaching modes. With respect to physical education content reform, Zhang Zuobin advocates for the reform of general physical education, which should be designed to cater to the requirements of school physical education themes, increase health education content, and reflect regional and institutional characteristics (Zhang, 2010). Regarding physical education teaching mode reform, Zhang proposes the “effective physical education teaching mode” reform path, which involves the prioritization of “health first” values, the development of an index system, and the maintenance of a teacher-led and student-centered teaching relationship (Zhang, 2015).

#### 5.2.3 Research on Ideological and Political Education in the Physical Education Curriculum of Colleges and Universities

The term “ideological and political education in curriculum” was coined after General Secretary Jinping Xi’s speech at the National Conference on Ideological and Political Work in Universities in late 2016. General Secretary Xi Jinping emphasized the importance of all curriculums aligning with ideological and political theory curriculums to achieve a synergistic effect (Pepole’s Daily, 2016). Since then, “ideological and political education in curriculum” has gradually spread across various disciplines and has become a hot topic in the study of physical education curriculums in Chinese colleges and universities. Wang Xiuge identified three main types of “ideological and political education in curriculum” in the physical education curriculum: elective courses in ideological and political education, comprehensive literacy courses, and professional physical education courses. Among these, the incorporation of “ideological and political education in curriculum” into professional physical education courses is the most widely adopted approach (Wang, 2019). In terms of research on the construction of ideological and political education in the physical education curriculum, Zaijun Li found that there are problems with the insufficient resources, awareness, and motivation for ideological and political education in physical education curriculums in China. To address these issues, Li suggested improving the ideological awareness of professional physical education teachers, establishing evaluation mechanisms, incentive mechanisms, and systematic mechanisms for “ideological and political education” in physical education curriculum, and exploring teaching

resources for physical education courses, among other things (Li et al., 2021).

#### 5.2.4 Research on Physical Education Curriculum Resources of Colleges and Universities

The resources of university physical education curriculum are crucial for achieving the objectives of physical education curriculum and teaching. They play a significant role in deepening the reform of university physical education curriculum and teaching. Duan Changbo revealed that the Chinese university physical education curriculum was deficient and lagging behind in content resources, implementation resources, human resources, material resources, extracurricular resources, and information resources. To address this issue, Duan suggested that universities should develop and utilize various physical education curriculum resources based on local conditions, establish a student-centered curriculum system, and improve the settings of university physical education curriculum (Duan et al., 2011). In a specific field, Shan wei used the tennis course venue as an example and elaborated on how to develop and utilize the tennis course venue resources, including the resources of sports venues such as basketball courts, volleyball courts, and badminton courts, as well as tennis courts. Shaanwei provided highly informative and operational suggestions (Shan et al., 2017).

## 6. Conclusion

This paper analyzed the literature related to Chinese university physical education curriculum research from January 1, 1984 to December 31, 2022 included in CNKI, and a total of 3087 papers were obtained by searching according to the topics and time range limited in this paper. The temporal distribution, research power and hot topics in this field were analyzed and revealed through bibliometric and co-word analysis, and then summarized the main characteristics of university physical education curriculum research in China in the past four decades. In terms of time distribution, Chinese university physical education curriculum research has gone through a period of slow formation, initial growth and rapid growth, and has now entered a mature and stable period; in terms of research power, there is a lack of highly influential research institutions and researchers in China; in terms of research hot topics, Chinese scholars mainly focus on university physical education curriculum reform, university physical education teaching reform, university ideological and political education in physical education curriculum and university physical education curriculum resources. In general, the research on university physical education curriculum in China still needs to be further deepened and expanded in terms of ideas, methods, breadth and depth, so as to promote the comprehensive and in-depth reform and development of university physical education curriculum practice in China.

## References

- Duan, C. B., Li, S. H., & Zong, J. J. (2011). A Study of Status Quo of Physical Education Curriculum Resources in Universities & Developmental Utilization. *Theory and Practice of Education*, 6, 61-62.
- Fan, B. (2018). Study on the Mechanism for Building Characteristic Sports Towns Based on the

- Rooting Theory. *Sports & Science*, 39(01), 84-89.
- Huang, X. B., & Wu, G. (2019). Research Review of Frontier Detection Methods in Subject Fields. *Journal of the China Society for Scientific and Technical Information*, 38(08), 872-880.
- Li, J., & Chen, C. M. (2016). *CiteSpace: Text Mining and Visualization in Scientific Literature (Second Edition)*. Beijing: Capital University of Economics and Business Press.
- Li, Z. J., Liu, M., & Zhao, Y. T. (2021). Curriculum Education: Characteristics, Difficulties and Strategies of Ideological and Political Construction in Curriculum of Sports Disciplines in Colleges and Universities. *Journal of Shenyang Sport University*, 40(03), 18-24+32.
- People's Daily. (2016-12-09). *Xi Jinping Emphasizes the Need to Integrate Ideological and Political Work throughout the Entire Process of Education and Teaching, and Create a New Situation for the Development of China's Higher Education, at the National Conference on Ideological and Political Work in Colleges and Universities*. Retrieved from <http://dangjian.people.com.cn/n1/2016/1209/c117092-28936962.html>
- Ren, W., & Huang, J. (2019). A Co-word Analytical Exploration of Hot Topics and Development Trends in Interpreting Studies in China (2008-2018). *Chinese Translators Journal*, 40(5), 37-47.
- Shan, W., Jiang, X. H., Hao, S. Y. et al. (2017). Research on the Development and Utilization of Tennis Course Resources in Universities. *Journal of Sports and Culture*, (07), 130-134.
- Shi, Y., & Huo, X. Y. (2017). The Mapping Knowledge Analysis of Sport Risk Domain Research. *China Sport Science*, 37(02), 76-86.
- Wang, X. G. (2019). On the Essential Issues of Ideologicalizing and Politicalizing Courses—Reflects on the Ideologicalizing and Politicalizing Courses of Sports. *Journal of Tianjin University of Sport*, 34(03), 188-190.
- Xu, T., Zhang, S. Z., & Zhang, X. J. (2013). Research on Reforming College Physical Education Curriculum from the Perspective of Leisure Sports. *Heilongjiang Higher Education Research*, 31(11), 155-157.
- Yin, L. (2013). Implications of Reforming University Physical Education Curriculum in Japan. *Education and Career*, (16), 102-103.
- Zhang, L., Ding, J., Kang, X. Y. et al. (2020). Research on the Teaching Reform of Public Physical Education in Universities of Shanxi. *Theory and Practice of Education*, 40(09), 59-61.
- Zhang, W. P., He, Q. H., & Duan, L. (2019). Hot Spots, Issues and Prospects in Researches of School Physical Education Policy in China. *Journal of Sports Adult Education*, 35(02), 1-9.
- Zhang, X., & Chen, X. J. (2018). Zhiqiang Zhang. The Development Trend and Hotspot of International Medical Informatics in Recent Ten Years—Bibliometric Analysis Based on Ten High Impact English Journals. *Journal of Modern Information*, 38(12), 151-163.
- Zhang, X. Q. (2015). Construction and Implementation of the Physical Education Effective Teaching Model. *Journal of Guangzhou Sport University*, 35(01), 106-109.
- Zhang, X. Z. (2000). Research on Several Theoretical Issues in the Construction of Physical Education

Curriculum in Colleges and Universities. *Journal of Lanzhou University*, (S2), 294-297.

Zhang, Z. B. (2010). Reflections on Reforming the Content of Physical Education Teaching in Colleges and Universities. *Education Exploration*, (07), 47-48.