

An Analysis of the Research Methods of Physical Education Curriculum and Teaching in Recent Five Years in China

Fengmei Yuan ^{1,a}, Chengbo Zhang ^{2,b} and Xuemei Li^{1,c,*}

¹ College of Physical Education, Yunnan Normal University, No. 768 Juxian street, Chenggong district, Kunming, Yunnan, China

² Yunnan Vocational College of Mechanical and Electrical Technology, No. 704 Longquan road, Panlong district, Kunming, Yunnan, China

^a190805115@qq.com, ^b474017162@qq.com, ^c1611040376@qq.com

*Corresponding author

Keywords: Physical Education Curriculum and Teaching; Research Methods; Empirical Evidence

Abstract: From the research on the academic research methods in the field of Physical Education curriculum and teaching published in China in 2018, it is found that there is no significant change in Physical Education curriculum and teaching research methods in China, in which speculative research and empirical research each account for half, qualitative research accounts for a large proportion of empirical research, among which the literature method has the highest proportion, and the quantitative research has the highest proportion of descriptive statistics. In the past five years, there has been no significant change in the types of methods for collecting data, but there are significant differences in the types of methods for collecting data and data in different types of empirical research.

Introduction

Modern sports science is a multi-disciplinary applied science system, and the research methods of related subjects are very rich. The research of Physical Education curriculum and teaching is an important research content of Physical Education, and its research methods are also rich. At present, some scholars have carried on the empirical analysis to the Physical Education curriculum and the teaching domain research, has carried on the discussion to its research domain, the research topic, the research angle, the author and its unit and so on, but the research which has discussed the characteristic of the research method adopted is relatively lacking. With the emphasis on innovation, the demand for scientific research methods in Physical Education curriculum and teaching research field is increasing day by day. Although there is more literature on research methods available in related fields, the literature on Physical Education curriculum and teaching research methods is relatively scarce. This study analyzes the research methods used in the published Physical Education curriculum and teaching academic papers in China in the past five years, discusses its characteristics, and tries to find its enlightenment to the development and improvement of Physical Education curriculum and teaching research methods in China.

Method

The Data Sources. Taking "Physical Education curriculum" or "Physical Education teaching" as the key words, 335 papers collected by CSSCI in 2014-- 2018 were searched, 48 articles such as book reviews, unit introductions and character introductions were excluded, and the characteristics of the research methods used in the research of Physical Education courses and teaching in China were analyzed with the remaining 287 valid documents as analysis samples.

The Classification of Research Methods. Research methods usually refer to the tools and means used in the research, and the classification standards of research methods are different at home and abroad. According to the research needs and referring to the previous research, this paper

divides the research methods into speculative research and empirical research. Empirical research includes three categories: qualitative research, quantitative research and comprehensive research. Under these categories, different research methods can be subdivided. Qualitative research includes seven categories: case study, historical research, text analysis, action research, discourse analysis, literature method and others.

Empirical research is a kind of research that researchers personally collect all kinds of data, so as to understand objective phenomena, and collecting factual data is the basis of empirical research. On the basis of summing up previous studies, this paper divides the methods of empirical research into the following categories: questionnaire survey, interview, on-the-spot investigation, test, text data, network information, second-hand statistics, electronic databases.

The Analysis Method of Data. In order to analyze the research methods and characteristics of the sports course and the teaching field in China for the last five years (2014-2018), this study uses the SPSS statistical software to carry out the statistical analysis of the types of the research methods used in the retrieval of the effective documents. then the distribution state of the research method type adopted by the paper published in different years is analyzed and analyzed and the second test is carried out, and the distribution characteristics, the difference degree and the development trend of the various research methods are compared and compared; In the end, the quantitative and qualitative research methods used in the empirical research papers, as well as the methods of collecting the data, are carried out to carry out the quantitative statistical analysis and the quantitative analysis of the data, so as to compare the differences between the specific research methods used in the different empirical research papers and the methods of collecting data.

Results

Analysis on the Types and Changing Trend of Research Methods Used in Physical Education curriculum and Teaching Academic Papers Published in the Past Five Years. Table 1 compares the types of research methods used in academic papers published in the field of Physical Education curriculum and teaching in the past five years. It can be seen from table 3 that 144 of the 287 academic papers published in the past five years are speculative, accounting for 50.2%, and 143 are empirical research papers, accounting for 48.8%. Among the empirical research papers, 99 (69.2%) adopted qualitative research methods, 35 (24.5%) adopted quantitative research methods, and 9 (6.3%) adopted comprehensive research methods, indicating that the proportion of speculative research and empirical research was about the same in the field of Physical Education curriculum and teaching, and the researchers did not show special preferences. In the empirical research papers, qualitative research methods were the main ones. The data in Table 3 also reflect the changes of the types of research methods used in academic papers published in the field of Physical Education curriculum and teaching research from 2014 to 2018. The results of Pearson chi-square test show that there is no significant change in the types of research methods used in academic papers published in the field of Physical Education curriculum and teaching in China from 2014 to 2018 ($\chi^2 = 17.112, P = 0.145$). It can be seen that the proportion of speculative research shows a downward trend in fluctuation, and the proportion of empirical research has an upward trend in fluctuation. The result shows that the change trend of the three methods of empirical research is not obvious, in which the proportion of qualitative research shows an upward trend in fluctuation, the proportion of quantitative research shows a downward trend as a whole, while the proportion of comprehensive research shows a small and overall downward trend.

Table 1. Types of research methods used in sports courses and academic papers published in the last five years

Types	2014		2015		2016		2017		2018		Total	
	Fre qu -enc	sca le										

		y		y		y		y		y		y	
	Theoretical Research	30	46.2	38	52.1	32	56.1	25	50	19	45.2	144	50.2
Empirical research	Qualitative research	25	38.5	22	30.1	16	28.1	18	36	18	42.9	99	34.5
	Quantitative research	4	6.1	12	16.4	8	14	7	14	4	9.5	35	12.2
	Comprehensive research	6	9.2	1	1.4	1	1.8	0	0	1	2.4	9	3.1
	Total	65	100	73	100	57	100	50	100	42	100	287	100

The Type and Trend of the Qualitative Research Method Used in the Sports Course and the Teaching Papers Published in the Last Five Years. Table 2 lists the research methods used in the qualitative research papers published in the last five years, and it can be seen from the table that 99 (two or more qualitative research methods will be used for some of the paper) published in the last five years. In a total of 115 qualitative research papers (excluding the qualitative research methods used in the comprehensive study paper), the proportion of the literature method was the highest, accounting for 56.5%, followed by a text analysis (17.4%) and a historical study (11.3%). Case studies (7.8%), other studies (5.2%), action studies (0.9%), and analytical methods (0.9%) used less. The results of the Pearson chi-square test show that there is a significant difference in the proportion of the method of literature, text analysis and historical research ($\chi^2 = 19.282$, $P = 0.013$), and the proportion of the three main methods of research shows a tendency to decrease in the fluctuation.

Table 2. Types of qualitative research methods used in Physical Education curricula and teaching academic papers published in the past five years

Types	2014		2015		2016		2017		2018		Total	
	Freq u -ency	scal e										
Case study	0	0	2	8.7	1	5.6	4	23.5	2	11.1	9	7.8
Historical research	8	20.5	5	21.7	0	0	0	0	0	0	13	11.3
Text analysis	6	15.4	7	30.4	1	5.6	1	5.9	5	27.8	20	17.4
Action research	1	2.6	0	0	0	0	0	0	0	0	1	0.9
Discourse analysis	1	2.6	0	0	0	0	0	0	0	0	1	0.9
Literature method	21	53.8	9	39.2	14	77.7	10	58.8	11	61.1	65	56.5
Others	2	5.1	0	0	2	11.1	2	11.8	0	0	6	5.2
Total	39	100	23	100	18	100	17	100	18	100	115	100

Analysis on the Types and Changing Trend of Quantitative Research Methods Used in Physical Education curriculum and Teaching academic Papers Published in the Past Five

Years. Table 3 lists the methods used in the quantitative research papers published in the last five years, as can be seen from the table: in the last five years of the sports curriculum and the 35 quantitative research papers (excluding the quantitative research methods used in the comprehensive study paper), the descriptive statistics are the highest, 40.9%, followed by T-test (27.3%), variance analysis (10.6%), regression analysis (7.6%), knowledge map (6.1%), factor analysis (4.5%) and related analysis (3%). The results of the Pearson chi-square test showed that there was no significant difference in the proportion of the three main methods of quantitative research ($\chi^2 = 4.135$, $P = 0.845$). Since a number of quantitative analysis methods may be used in a paper, 66 times of quantitative research methods of different types are used in five years, and 1.89 quantitative analysis methods are used for a quantitative study.

Table 3. Types of quantitative research methods used in sports courses and academic papers published in the last five years

Types	2014		2015		2016		2017		2018		Total	
	Freq u -ency	scal e										
Descriptive statistics	8	50	3	23.1	3	25	5	55.6	8	50	27	40.9
T-test	4	25	5	38.4	3	25	2	22.2	4	25	18	27.3
Correlation analysis	1	6.3	0	0	1	8.3	0	0	0	0	2	3
Factor analysis	0	0	2	15.4	0	0	0	0	1	6.3	3	4.5
Variance analysis	2	12.4	1	7.7	2	16.7	1	11.1	1	6.2	7	10.6
Regression analysis	1	6.3	1	7.7	2	16.7	0	0	1	6.2	5	7.6
Knowledge graph	0	0	1	7.7	1	8.3	1	11.1	1	6.3	4	6.1
Total	16	100	13	100	12	100	9	100	16	100	66	100

An Analysis of the Information and Data Methods of the Empirical Research Papers on Physical Education curriculum and Teaching Published in the Past Five Years. Table 4 shows the use of data and data collection methods for sports and teaching research published in the last five years, and 45 (31.4%) of the 143 papers for empirical research have not described the method of collecting data and data. 39 (27.3%) used two or more methods to collect data and data; in a separate data collection method, the proportion of the use of text data was up to 11.2%, the electronic database (9.1%), the test (7%), and the questionnaire (4.9%). The use of field visits (4.9 per cent) was relatively low, while the use of interviews, network data and second-hand statistics was low. The results of the Pearson chi-square test show that there is no significant change in the type of method for collecting data and data from the academic papers of the Chinese sports course and teaching research in the last five years ($\chi^2 = 50.528$, $P = 0.055$).

Table 4. Empirical research papers on Physical Education curriculum and teaching published in the past five years collect information and data methods

Types	2014		2015		2016		2017		2018		五年合计	
	Freq u -ency y	scal e										
Questionnaire survey	1	3.3	1	2.9	1	3.8	2	8.7	2	6.7	7	4.9
Interview	2	6.7	0	0	1	3.8	0	0	1	3.3	4	2.8

On-the-spot investigation	1	3.3	0	0	3	11.5	2	8.7	1	3.3	7	4.9
Test	3	10	2	5.9	2	7.7	1	4.3	2	6.7	10	7
Text data	3	10	7	20.6	0	0	1	4.3	5	16.7	16	11.2
Network information	0	0	0	0	1	3.8	0	0	0	0	1	0.7
Second-hand statistics	0	0	0	0	1	3.8	0	0	0	0	1	0.7
Electronic databases	7	23.3	2	5.9	1	3.8	1	4.3	2	6.7	13	9.1
Using two or more methods	9	30	15	44.1	3	11.5	6	26.1	6	20	39	27.3
Not specified	4	13.4	7	20.6	13	50	10	43.6	11	36.6	45	31.4
Total	30	100	34	100	26	100	23	100	30	100	143	100

Table 5. Comparison of data and data collected from empirical research papers published in the past five years

Types	Qualitative research		Quantitative research		Comprehensive research		Total	
	Frequency	scale	Frequency	scale	Frequency	scale	Frequency	scale
Questionnaire survey	2	2.0	18	51.4	4	21.1	24	16.8
Interview	11	11.1	10	28.6	0	0.0	21	14.7
On-the-spot investigation	8	8.1	4	11.4	2	10.5	14	9.8
Test	0	0	13	37.1	8	42.1	21	14.7
Text data	31	31.3	0	0	0	0	31	21.7
Network information	0	0	2	5.7	1	5.3	3	2.1
Second-hand statistics	0	0	1	2.9	1	5.3	2	1.4
Electronic databases	30	30.3	7	20	3	15.8	40	28.0
Not specified	44	44.4	0	0	0	0	44	30.8
Total	126	127.3	55	157.1	19	100.0	200	149.3

Table 5 shows the methods of collecting data and data in Physical Education curriculum and teaching empirical research papers published in the past five years. There are 23 articles (23.2%) using two or more methods in qualitative research papers, 16 (45.7%) in quantitative research papers, and all 9 comprehensive research papers use two or more methods to collect data and data, among which the test method is the most frequently used. It accounted for 88.9%. Among the papers of qualitative research, the proportion of papers that did not explain the data source was the highest, accounting for 44.4%. The methods with high frequency of use were the use of text data 31 times (31.3%) and the use of electronic database 30 times (30.3%), while the other data collection methods were less used. In the quantitative study, all the papers explained the data sources. The most frequently used data collection methods were 18 questionnaires (51.4%), followed by 13 tests (37.1%) and 10 interviews (28.6%). The results of Pearson chi-square test showed that the results of Pearson chi-square test showed that the most frequently used data collection methods were

questionnaire survey 18 times (51.4%), followed by test method 13 times (37.1%) and interview method 10 times (28.6%). The results of Pearson chi-square test showed that In the past five years, there are significant differences in the methods of collecting data and data between different types of empirical research on Physical Education curriculum and teaching in China ($\chi^2 = 147.016$, $P = 0.000$).

Conclusion

On the whole, the types of research methods used in academic papers published in the field of Physical Education curriculum and teaching research did not change significantly from 2014 to 2018 ($\chi^2 = 17.112$, $P = 0.145$). Of the 287 academic papers published in the past five years, speculative papers accounted for 50.2%, empirical research papers accounted for 49.8%, qualitative research methods accounted for 69.2%, quantitative research methods accounted for 24.5%, and comprehensive research methods accounted for 6.3%, indicating that the proportion of speculative research and empirical research was about the same in the field of Physical Education curriculum and teaching. The researchers did not show special preference, in the empirical research paper, qualitative research methods are the main methods. In the past five years, the proportion of speculative research has shown a downward trend in fluctuation, while the proportion of empirical research has an upward trend in fluctuation. The change trend of the three methods of empirical research is not obvious, among which the proportion of qualitative research shows an upward trend in fluctuation, the proportion of quantitative research shows a downward trend as a whole, while the proportion of comprehensive research shows a small and overall downward trend.

The analysis of the research methods used in the qualitative research papers published in the past five years shows that the proportion of qualitative research papers in Chinese is the highest, accounting for 56.5%. The second was text analysis (17.4%), historical research (11.3%), case study (7.8%), other studies (5.2%), action research (0.9%) and discourse analysis (0.9%). The results of Chi 2 test showed that there were significant differences in the proportion of literature, text analysis and historical research methods. ($\chi^2 = 19.282$, $P = 0.013$), and the proportion of the three main qualitative research methods showed a downward trend in fluctuation.

By analyzing the methods used in quantitative research papers published in the past five years, it can be seen that the proportion of descriptive statistics used in quantitative research papers is the highest, accounting for 40.9%. The second was T test (27.3%), variance analysis (10.6%), regression analysis (7.6%), knowledge graph (6.1%), factor analysis (4.5%) and correlation analysis (3%). The results of Chi 2 test showed that there was no significant difference in the proportion of descriptive statistics, T test and variance analysis ($\chi^2 = 4.135$, $P = 0.845$). The proportion of the three main quantitative research methods is unstable and shows a large fluctuation range. In the past five years, different types of quantitative research methods were used 66 times, and an average of 1.89 quantitative analysis methods were used in a quantitative research paper.

The analysis of the data and the use of data collection methods published in recent five years shows that 31.4% of the empirical research papers have not explained the methods of collecting data and data, and 27.3% of them have used two or more methods to collect data and data. Among the data collection methods used alone, the proportion of using text data was the highest (11.2%), electronic database (9.1%), test (7%), questionnaire survey (4.9%), field visit (4.9%), while the proportion of interviews, network data and second-hand statistics was very low. 23.2% of the articles used two or more methods in qualitative research papers, and 45.7% in quantitative research papers. All the comprehensive research papers used two or more methods to collect data and data, among which the test method used the highest frequency, accounting for the results of 88.9%. Pearson chi-square test. In the past five years, the types of methods for collecting data and data from academic papers of Physical Education curriculum and teaching research in China have not changed significantly ($\chi^2 = 50.528$, $P = 0.055$). The proportion of papers that do not explain the research methods is the highest (44.4%). The methods with high frequency of use are 31 times of text data (31.3%) and 30 times of electronic database (30.3%). Other data collection methods are less used. Among the quantitative research papers, the most frequently used data collection method

is questionnaire survey, accounting for 51.4%, followed by test method (37.1%) and interview method (28.6%), while other methods are less used. The results of Pearson chi-square test show that there are significant differences in the types of data and data collected between Physical Education curriculum and different types of empirical research in China in the past five years ($\chi^2 = 147.016$, $P = 0.000$).

Acknowledgements

This research is supported by the Scientific Research Project of Yunnan Education Department (No. HX2019120341).

References

- [1]. Jia Qi. Experience on the Methodology of Teaching Research in Physical Education[J]. Sports and Science, 2013, 34 (6): 17: 20.
- [2]. Huang Juyun. The Evolution and Reflection of Sports Research Methodology in China in the Past 30 Years [J]. Journal of Shanghai Institute of Physical Education, 2008, 32 (4): 18: 24, 31.
- [3]. Lu Genshu, Liu Ping, etc. Comparison of Educational Research Methods Between China and Foreign Countries: an Empirical Analysis of Nine Educational Research Journals at Home and Abroad [J]. Higher Education Research, 2016, 37 (10): 55.
- [4]. Gao Yaoming, Fan Wei. Chinese Higher Education Research Method: 1979 -2008---Based on CNKI China Citation Database (New) Content Analysis of Highly Cited Papers on "Special Topics of Higher Education" [J]. University Education Science, 2010, 3 (3): 18: 25.
- [5]. Liu Yimin, Cao Li. Research Object and Methodological Characteristics of Sports Humanities Sociology [J]. Journal of Wuhan Institute of Physical Education, 2008, 42 (2): 16 (20).
- [6]. Lu Xiacong, Cao Zuyao, Zhang Xiufeng. The Construction of Sports Sociology [J]. Sports Science, 2010, 30 (11): 9: 16.