

Research on Innovation of Physical Education Teaching Method based on Inquiry Teaching: A Survey based on Online Questionnaire

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Abstract

In recent years, with the infiltration of new ideas in physical education, many new teaching methods have emerged. Multimedia, network and other technologies can be used to improve the teaching methods and tools. These not only enrich the form of physical education, but also play a supporting role in technical action learning. In this paper, we analyze the innovation of physical education teaching method by using network questionnaire as a new type of data source, the result shows that physical education teaching based on learning can effectively stimulate students' interest in exercise. Meanwhile, the result of students in physical education from cognitive experience, exploring issues manner, independent learning also shows the same conclusion. On this basis, we put forward the related suggestions to improve modernization of teaching methods in physical education.

Keywords: *Physical education; network survey; inquiry teaching; physical quality; autonomous learning*

1. Introduction

With the development of computer network technology and its advantages, network survey will become one of the main ways of statistical survey in China, and it is also an important means to implement marketing strategies in all walks of life [1]. Compared with the traditional survey method, the network survey makes the whole process easier, and the distribution of the questionnaire information can be completed in a short time, the data can also be obtained at a lower cost and directly on the computer. Innovative education is the extension, expansion and deepening of quality education and it is an important way to cultivate creative talents with high quality [2]. Through the research on the teaching methods of innovative education, it can not only promote the concept of sports teachers to update their ideas, change roles, improve teaching quality and efficiency, but also create a student independent thinking, the courage to explore, and constantly innovate the learning environment, to help students master the learning method, the formation of the correct attitude and sports values. The purpose is to promote the school sports theory research, enrich and innovate the modern sports teaching to provide reference.

The implementation of basic education is mainly through the teaching activities. The process of teaching activities is a process of the unification of the knowledge and experience of human beings, the subjective world and the harmonious development of the individual [3]. Teachers and students together for the completion of the teaching tasks, the implementation of a series of methods, measures, so that students master the knowledge and skills, the development of the ability of the process. The teaching activities cannot be separated from the support

of teaching methods [4]. The teaching method is the method and measure adopted by teachers and students to complete the teaching task and to realize the teaching goal. It is an important category in the teaching theory and the methodology foundation of the teaching activity. Its effectiveness is related to the realization of teaching goal and the realization degree. It can be said that the teaching methods of scientific nature, directly determines the quality and efficiency of teaching and learning." The educational circles have a long history of research on teaching methods, and the research results of each stage played a role in promoting the teaching activities at that time. However, due to the impact of the old education concept, combined with the "inertia" of the teaching method, the teaching method and the talent training are not consistent, which led to the constant reflection on the teaching method.

2. Literature Review

2.1 Network Survey Data

Data preprocessing is an important step in the process of data mining knowledge discovery, especially in data mining, it is necessary to improve the quality of data mining object and to improve the quality of data mining. Data integration is the future from multiple data sources such as databases, files and other data together [5]. Due to the description of the same concept attribute in different database to take different names, in the data integration will often cause data inconsistency or redundancy, a large amount of data redundancy will not only reduce the mining speed, but also will mislead the mining process. So in addition to data cleaning, in the data integration also need to pay attention to the elimination of redundant data. In addition, after the completion of data integration, and sometimes also need to data cleaning in order to eliminate possible data redundancy. Data mining tasks often involve data integration, coming from multiple data sources of data, such as database, data cube, common documents, combined with together and form a unified data collection to data mining work done successfully complete the data foundation.

In general, the traditional network survey questions, including multiple-choice questions, multiple-choice questions, open, and matrix problem. Among them, the choice of title, open choice, sort and matrix has a good data storage structure and paradigm, will not involve the interpretation of the semantics, and therefore suitable for pretreatment [6]. But for questions, answer content focused on the text description, the usual data preprocessing algorithm difficult to deal with, due to the processing methods and the process, according to the research contents of questionnaire, the respondents related data and domain knowledge by man-machine combination method by manual filled or ignore the record. According to the characteristics of network survey data, this paper mainly considers the data problem of the discrete data when dealing with the data [7].

In this paper, the network survey data pretreatment process is divided into two stages. The first stage is the general control stage, the stage is the use of relational database, software engineering, machine learning and other theories and methods, in the design and development stage of the network survey system is completed, and the role of each individual in the implementation of the investigation. For example, in the investigation of network design stage, give full consideration to the respondents to the questions in the questionnaire items no answer and questions of the questionnaire important degree, modify the "answer" properties, control respondents might be the item non response, reduce non response. But due to the excessive control will enable the respondents have a reverse psychology, and the abandonment of the entire questionnaire. Therefore, it is a kind of auxiliary means.

The second stage is the individual treatment stage. The stage is key stage of the network survey data preprocessing and web survey system must be predefined such processes, in order to satisfy the data analysis and subsequent mining requirements.

2.2 Teaching Method Innovation of Physical Education

In recent years, with the infiltration of new ideas and new ideas in physical education, many new teaching methods have emerged." This enriches the sports teaching activities, but also become the focus of education workers have been highly concerned. In this paper, the theory and practice of physical education teaching methods under the concept of innovative education are studied:

1) ***The implementation of innovative education:*** idea of education in our country is relatively backward, content method is relatively old, heavy academic burden on students, quality education difficult to promote [8]. Adhere to educating people, to reform and innovation as the driving force, to improve the quality of the core, the overall implementation of quality education." The sports teaching adhere to the people-centered education[9], the implementation of innovative education is to be student-centered, teacher led, give full play to the initiative of students; means to continue the reform of teaching contents, methods, improve teaching quality, promote physical and mental health, improve students physique health; learning ability and innovation ability of students, education students to learn knowledge and skills, work skills, learn to live, learn to behave; advocate the innovation of physical education teaching methods, such as heuristic teaching, inquiry teaching, discussion teaching, help students master the learning skills and knowledge, stimulate students' curiosity, cultivate students' interest in learning, to create a good environment for students' independent thinking, free inquiry, the innovation of the.

2) ***To improve the learning efficiency, and adapt to the curriculum reform needs:*** with the increasing social competition, students' academic burden. Children have no night to learn, and some even appeared the spirit of manic, unhealthy psychological phenomenon. While most people are aware of the examination oriented education to bring the child's injury and shortcomings, but also know how to reform, but in fact, it is difficult to change the fundamental [10]. The starting point of the curriculum reform is the students, the student's learning effect, ability training as a measure of curriculum reform. From the physical education students to the often associated with actual teaching given is far different, resulting in students of physical education disappointed and lose the exercise of confidence and enthusiasm. Study of physical education teaching method not only reveal the physical education curriculum reform problems, resolve confusion in the hearts of teachers, and promote students like physical education and actively take the initiative to participate in sports activities to provide help and reference.

3) ***Enhance students' physique, explore the teaching methods:*** it is well known that the reasonable teaching method can not only make the teaching effect more effective, but also enable students to benefit from life. Whether the method of organizing teaching or guiding students to practice the method will affect the students learning enthusiasm and initiative, also will affect the students in the future exercise habit forming, the training of consciousness, can say, the sports teaching method research is the effective way to promote adolescent students physical health. As far as the teaching

method is concerned, it is not only a skill but also an art, whether the selection and use of it directly affects the students' interest in learning and the effect of physical education. Why some teaching methods are enduring, and some methods, but is as ephemeral, the key is with changes to improve the progress of the society and education development, students of the physical education teaching methods constantly updated. To explore a certain stage, a certain period of time, suitable for certain groups of teaching methods is not easy, it is more difficult to apply, in the limited classroom teaching, so that students can learn, learn, learn fine, after class to continue to use the method is worth studying.

3. Model Design and Method

3.1. Object of Study

On the practice of sports teaching methods, most of the sports teaching methods are often not simple, but a variety of teaching methods, means, tools combined to form a teaching method, the conclusions are not the same, and some are more innovative ability of college students, and some innovative awareness of primary and secondary school students. These studies have given us a lot of inspiration, but there are some deficiencies, such as the implementation of some teaching methods are unknown; mostly from the good aspects of research, the use of the scope and matters are often ignored; the experimental results of the hypothesis is not strong, just simple persuasion; the whole paper to illustrate the problem of insufficient support and so on. In this paper, "physical education teaching methods under the concept of innovation education" as the research object; University of Chinese Medicine Shaanxi as the experimental object; the school physical education teachers and students as the survey object, a total of 1000 students were investigated.

3.2. Research Method

Literature, through the National Library, Beijing Sports University Library, CNKI and other channels, access to and the related research, education, teaching theory, psychology, sports science and other documents, which works more than 30, doctoral and more than 30 papers, journal articles more than 200 articles. Through the collation of historical materials, excavation and reorganization, using history and logic analysis, on the course of the history of physical education teaching methods and the concrete implementation effect review, summarize, absorption, compared with the refined, explore the teaching methods of the sports connotation, application and innovation, the full and accurate basis for the Research of the foundation.

Design of questionnaire, under the concept of innovation education teaching methods of physical education teacher questionnaire and student questionnaire is designed according to the research tasks, follow the method of sport scientific research about the questionnaire design requirements. In order to test the questionnaire reliability, the design of questionnaire using the test-retest method respectively to the research object of repeated test, time interval of 15 days, the data are put into the R formula, and calculates the teacher questionnaire reliability coefficient $R=0.802$, student questionnaire reliability coefficient $R=0.823$ that the reliability of the questionnaire survey with high reliability test standard.

In terms of the structure of the student questionnaire, 12 professors think it is appropriate, but there are 1 that is not appropriate; the content of the questionnaire, 11 professors think it is appropriate, 3 think fit, 1 think basic right; the overall

questionnaire, there are 12 professors think it is appropriate, 2 think fit, 1 think basically suitable.

Table 1. Questionnaire Validity Test (N=15)

	Very suitable	suitable	Basic fit	Not suitable	Inappropriate
Structure	12	2	1	1	0
Content	11	3	1	0	0
Overall questionnaire	12	2	1	0	0

3.3. Physical Education Teaching Method

The essence of sports is to enhance physical fitness, physical education is to enhance the health of students as the main goal, which is the eternal theme, leaving the most important subject, the sports teaching methods designed to deviate from the theme. The teaching content is rich and colorful, the teaching method is various, the organization is changing, which requires the physical education teachers to increase the elective course, dig the local teaching materials, organize the teaching methods and means, and to improve the students' practice effect. Design of sports teaching methods cannot be separated from the choice of teaching content, the difficulty of the arrangement, the realization of the goal of multi way, a variety of sports teaching methods, choose suitable for their teaching ability, student foundation, practical equipment conditions of teaching method can play a good teaching effect. PE boring for a long time, together with the teaching method of sports old-fashioned and monotonous, students in PE class resentment, increase the interest of teaching methods, not only to the teaching effect to promote and to students treat the attitude of physical education is also crucial.

In the survey of 194 questionnaires, 86% of the physical education teachers in the design of teaching methods are basically from the perspective of students or learning method, for students of different basis, skill level, ability to accept, willing to learn content and other aspects to design a reasonable physical education teaching methods, which is essential for the organization of students in the classroom practice, improve teaching efficiency. If there is no prior design, then a good physical education teaching methods are difficult to implement. Physical education teaching methods are varied, the following table lists some teaching methods, the statistical results of the use of Physical Education Teachers.

Table 2. Teaching Methods of Physical Education Teachers

	Always use	Often used	Occasionally use	Not commonly used	Never used
Demonstration method	112	76	6	0	0
Correct error method	75	93	22	4	0
Decomposition method	72	92	26	4	0
Game method	50	96	42	6	0
Scenario	23	59	74	33	5
Cooperation	26	86	63	18	1
Implied method	25	40	85	32	12

Heuristic teaching method	34	93	51	14	2
Problem inquiry method	24	66	70	27	7
Group law	21	80	63	22	8

It can reflect the situation of the physical education teachers' teaching methods. First, the above is basically some conventional teaching methods, these methods can be said that each class is used, and also repeated use; and the following sports teaching methods seem to be a little strange, do not rule out some sports teachers also virtually in use, but do not know how to sum up, or to use some of the links and content. If the inquiry method, although the physical education teachers will not be as described in the book as strict procedures, but to raise questions, guide students to inspire thinking and other individual links are often used. Generally reflect a law, from top to bottom, that is, the order of the traditional teaching methods to the new teaching methods, the proportion of physical education teachers from the regular use of the gradual reduction, and occasionally use, not commonly used ratio increased gradually. This fully shows that the physical education teachers to learn from advanced teaching methods, the implementation of the new teaching method is still very lacking, which is also need to strengthen the.

4. Empirical Analysis

4.1. Experimental Hypothesis

The experimental research of physical education teaching method is more common in the thesis, most of the sports teaching methods (such as game law, cooperative teaching method, autonomous learning method, etc.) and traditional teaching methods, conventional teaching methods for the comparative study, according to the "sports teaching activity main body and the method of the implementation of the prominent focus" as the standard, the sports teaching method is divided into two categories. The first category is "to teach the main" sports teaching methods, such as the method of explanation, demonstration, etc., highlighting the teacher's teaching function, the "teaching" as the main access to knowledge and skills of the channel, for the "teaching" as the core of the teaching methods. Another category is "to learn the main" of the physical education teaching methods, such as the discovery of law, research, etc., to highlight how to make students better access to knowledge, for the "learning" as the core, according to the needs of students and design and implementation of teaching methods. The experimental class and the control class are all by oneself class, the teaching content and the progress is completely consistent. The teaching method of the control class is in accordance with the traditional teaching method of physical education, and the teaching method of the experimental class is carried out according to the teaching method of "learning as the main" method. Students do not know in advance is in teaching experiments, but do not know the purpose and design of the experiment, and in the usual state of learning.

4.2. Changes in Physical Fitness of Students

First of all, it reflect the students' physical fitness of the data of the four indicators of homogeneity of variance test (F test), P greater than 0.05, to explain the homogeneity of variance. Then the data are tested by independent samples, and the results are as follows: Vital capacity refers to the maximum depth of breath, and then to do the maximum breath exhaled breath. Exercise can not only improve the

level of people's vital capacity, but also delay the decay of vital capacity." Vital capacity reflects one of the largest body activities in the lung, and it is one of the important indexes reflecting the heart and lung function of the human body.

Table 3. The Change of Vital Capacity of the Students

vital capacity	Control classes (n=62)	Experimental class (n=64)	T value	P value
Before experiment	2714.69±574.83	2865.02±632.63	1.979	0.255
After experiment	3048.55±499.57	3280.31±731.61	1.979	0.042*
Growth rate	305.85±249.34	415.60±333.38	1.979	0.041*

Vital capacity changes illustrate two points: first, physical exercise to improve the vital capacity of primary and secondary school students has an important role in promoting, whether the experimental class or the control class, after physical exercise, lung capacity has a certain degree of growth; second, the growth rate of students in the experimental class is higher than the growth of the control class. Because the "learning oriented" teaching method of physical education teaching methods or teaching methods can effectively stimulate students' interest in exercise, students in the classroom, after-school exercise will actively and consciously put into practice. Comparatively speaking, "to teach the main" sports teaching methods, students cannot take the initiative to exercise, a class of effective exercise time is very little, after school to continue to exercise the enthusiasm is not high, the growth effect of natural poor.

Men's 1000 meters, women's 800 meters is reflected in the ability of the middle and long distance running, the middle and long distance can reflect the speed, but also reflects the endurance, which belongs to the aerobic anaerobic wave for the energy of the project.

Table 4. The Change of 1000m/800m of the Students

1000m/800m	Control classes (n=62)	Experimental class (n=64)	T value	P value
Before experiment	255.81±29.84	248.56±36.10	1.979	0.223
After experiment	242.49±27.68	230.28±29.35	1.979	0.015*
Growth rate	13.02±12.64	18.28±16.21	1.979	0.044*

Before the experiment, there was no significant difference between the 1000 meters of the experimental class and the control class students, $p=0.223$. And after the experiment, the growth of the students in the experimental class was significantly higher than that in the control group, $p=0.015$, which showed that the difference was significant. At the same time, the growth of the students in the experimental class was compared with the control group, and the difference of the growth rate of the $p=0.044$ was also significant. The results show that the experiment has a significant effect on the students' achievement in meter meter race.

4.3. Changes in Learning Ability

The changes of student's learning methods are mainly from the student's cognitive experience of physical education, the way of exploring the problem, the autonomous learning situation, the overall response and so on. Statistics from the survey data, the experimental class students can experience the fun of learning, can concentrate on learning, willing to take the initiative in the physical education and other aspects than the control class are higher than the 10 percentage points. It also shows that the students in the experimental class are better than those in the control class under the influence of the teaching method of physical education.

Table 5. Student's Cognition of Physical Education

	Control classes		Experimental class		Growth rate
	N	%	N	%	%
Experience the fun of learning	43	79.63	52	96.30	16.67
Can be fully absorbed	39	72.22	48	88.89	16.50
Willing to take the sport class	45	85.32	51	94.44	11.11

The way students explore the problem is an important manifestation of the cultivation of innovative consciousness. Imparting knowledge is not the only objective of our education, compared with the development of the ability to be more valuable. The ability to guide and educate students to explore problems is to advocate the concept of innovative education, and it is also an important indicator of subjective evaluation of teaching effectiveness.

Table 6. Students Explore Problems of Physical Education

	Control classes		Experimental class		Growth rate
	N	%	N	%	%
Can find the problem	43	79.63	50	92.59	12.96
Can express different opinions	32	59.26	52	96.30	37.04
exploration to solve the problem	28	51.85	34	62.96	11.11
Analyze technical problems	36	66.67	46	85.19	18.52
Organization of peer discussion	43	79.63	47	87.04	7.41

Autonomous learning is of great significance to improve the learning effect. It is the embodiment of students' subjective initiative, which is the manifestation of the internal factors. On their own initiative, independent learning and learn to check their own, and the evaluation of learning effect two entries, experimental classes and control classes are higher than the more than 10 percentage points, to find their own reasons and improvement, experimental classes was higher than that of the control class is close to 10 percentage points; learn to self learning and control yourself, just above the 5.5 percentage points, effect difference is not very obvious.

Table 7. Students Autonomous Learning Situation

	Control classes		Experimental class		Growth rate
	N	%	N	%	%
Initiative and independent study	45	83.33	51	94.44	11.12
self-control	49	90.74	52	96.30	5.563
find the reasons and improvement	46	85.19	51	94.44	9.25
Self-examination to evaluate learning outcomes	44	81.48	50	92.59	11.10

Teachers believe that only they have the creativity, innovative ideas, the implementation of innovative teaching methods, the creation of innovative teaching situations, in order to cultivate students' innovative awareness. Their starting point is to improve their own, and then to train students. Are the main channels: first, to actively explore effective teaching methods, active teaching skills and innovative thinking with training; second, is good at absorbing the latest achievements in scientific research, and for teaching; third, develop students awareness of innovation elements, to enable students to preliminary master the ways and means of training creative consciousness; fourth, stimulate student's challenge on the original learning methods, teaching methods, teaching and learning to promote each other, teaching benefits teachers as well as students.

5. Conclusions

Physical education is developing with the development of school education. Sports teaching method is gradually developing along with the development of the discipline, from the training and mentoring of missionary methods become the method system of its own characteristics. It not only contains the general education method, and contain the sports special subject specific method. The continuous development and improvement of sports teaching methods, enrich the content of physical education class, realize the goal of physical education, and complete the task of physical education teaching. Its history also to us left a profound reflection: first, the teaching methods of physical education is along with the development of school education and continuous development; second, sports teaching method of native complex rubbing phenomenon is obvious. It not only shows the local function of instruction, and highlight the cultural characteristics of Western; third, the teaching methods of physical education from pedagogy, psychology, physiology and subject concept has more and more influence, transplantation method is also increasing.

5.1 Modernization of Teaching Methods of Physical Education

The modernization of the teaching method of physical education is presented with the development of modern teaching technology. Multimedia, high-definition video, network, visualization charts, equipment technology is the means of teaching methods and perfect. These not only enrich the form of physical education, but also play a supporting role in technical action learning. It is the content of the course for the students of knowledge, ability, thought, emotion, and thus to achieve the teaching purpose and service. In the course of teaching methods, it is bound to be subject to the constraints of the objective conditions of teaching environment. The method is mastered by teachers. Therefore, the

level of teachers' teaching ability, innovative thinking, innovative consciousness and ability all determine the innovation of teaching methods, and also determine the effect of the implementation of the method.

5.2 Personalized Sports Teaching Methods

Teaching is the teachers and students together to complete, the students are the main body, play the role of internal. To achieve good teaching effect, play the enthusiasm of the students, teaching students according to their aptitude is essential. Modern physical education teaching reflects the distinction between treatments, respect for the students, to carry out democratic teaching. To explain, demonstration, error correction based teaching methods have become to explore, independent, small groups based form. The reform of physical education teaching methods should also set up a new concept of education, pay more attention to the students' subjectivity, the whole society, the innovation and so on. To cultivate students' learning initiative, initiative and creativity has become a trend of teaching, and the teaching of physical education is no exception. The change of physical education thought from "sports method theory" to "sports aim theory", the emphasis of teaching method design is changed from "teaching" to "learning method", and the teaching method is changed from "Professor" to "guide". The sex education is every student's right, don't let every student "behind" is the responsibility of teachers. The design and application of sports teaching methods pay more and more attention to the differences between students of different levels, so that each student can experience the joy of success and joy, to ensure that all students can be improved and developed.

5.3 Concerned About the Students Creative and Social

Cultivating students' innovative ability is the sacred mission of education. Physical education teaching should also be good at tapping the students' creative potential and cultivating innovative consciousness and creativity, such as technological innovation, rules innovation, organizational form innovation, learning innovation. Physical education teachers should allow students to take the detour to explore, to stimulate students' curiosity, curiosity, innovative thinking, to give friendly encouragement and guidance, to provide students with innovative opportunities and environment. Physical education is an effective way to cultivate students' cooperation, competition, justice, dedication and other social virtues. The creation of physical education teaching methods can provide students with such conditions and opportunities, such as cooperative learning, group discussion, guidance and help method, model motivation, etc., not only can cultivate students' teamwork spirit and collective consciousness, but also can help people to help others, regulate behavior, friendly exchanges.

References

- [1] H. Janta and P. Lugosi, "Migrant networks, language learning and tourism employment", *Tourism Management*, vol. 33, no. 2, (2012), pp.431-439.
- [2] A.K. Kim and J. Davies, "A teacher's perspective on student centred learning: Towards the development of best practice in an undergraduate tourism course", *Journal of Hospitality, Leisure, Sport & Tourism Education*, vol. 25, (2014), pp. 6-14.
- [3] C. Zhang and X. Chen, "Use of Multimedia in Gross Infective Pathogen Experimental Teaching", *Procedia Engineering*, vol.37, (2012), pp.64-67.
- [4] M. Sigala, "Investigating the role and impact of geovisualisation and geocollaborative portals on collaborative e-learning in tourism education", *Journal of Hospitality, Leisure, Sport & Tourism Education*, vol. 11, (2012), pp. 50-66.
- [5] C. Krstev and A. Trtovac, "Teaching Multimedia Documents to LIS Students", *The Journal of Academic Librarianship*, vol. 40, no. 2, (2014), pp.152-162.
- [6] W. Dai and L. Fan, "Discussion about the Pros and Cons and Recommendations for Multimedia Teaching in Local Vocational Schools", *Physics Procedia*, vol. 33, (2012), pp.1144-1148.

- [7] M. Hu and S. Xu, "Research of Multimedia Teaching on Principles of Management", IERI Procedia, vol.2, (2012), pp. 666-670.
- [8] C. wei and Y.tao, "Application of Multimedia–Aided Project–Teaching Mode in Cultural Education", IERI Procedia, vol. 2, (2012), pp. 538-542.
- [9] Y. Huang and S. Backman, "Experiencing student learning and tourism training in a 3D virtual world: An exploratory study", Journal of Hospitality, Leisure, Sport & Tourism Education, vol. 13, (2013), pp. 190-201.
- [10] S. Jian-hua and L. hong, "Explore the Effective Use of Multimedia Technology in College Physics Teaching", Energy Procedia, vol. 17, (2012), pp. 1897-1900.

