Retraction

Retraction: Research on Physical Education in Colleges and Universities Based on Multimedia Big Data Environment (*J. Phys.: Conf. Ser.* **1802** 032008)

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The authors of the article have been given opportunity to present evidence that they were the original and genuine creators of the work, however at the time of publication of this notice, IOP Publishing has not received any response. IOP Publishing has analysed the article and agrees there are enough indicators to cause serious doubts over the legitimacy of the work and agree this article should be retracted. The authors are encouraged to contact IOP Publishing Limited if they have any comments on this retraction.

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Research on Physical Education in Colleges and Universities Based on Multimedia Big Data Environment

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Abstract. With the advancement of modern society, information exchange is convenient and fast, and the increase in data volume makes data more convincing. Therefore, in the context of big data, the evaluation of college physical education quality is more scientific and objective. In the context of the development of the era of big data, college physical education teaching models mainly involve three micro-classes, MOOCs, and flipped courses. Some colleges and universities use the Internet to innovate physical education teaching methods or introduce innovative teaching software to effectively improve college physical education. The individualized level of class teaching makes it more in line with the physical learning needs of students in the era of big data. Based on this, starting from the big data era and the development of college physical education, combined with specific teaching cases, several college physical education teaching models are introduced, in order to provide help for college physical education teachers to carry out class teaching.

1. Introduction
In 1997, the China Internet Network Information Centre analysed and investigated the penetration rate of the Internet and the scale of Chinese netizens. Until 2018, a total of 36 reports were issued. The report pointed out that the number of Chinese Internet users has shown an increasing trend year by year. In the five years from 2011 to 2018, the number of Chinese Internet users has increased by 447 million people. By 2018, the number of Chinese Internet users has reached 6.68 Billion (as shown in Figure 1).
The penetration rate of the Internet has also increased from 31.8% in 2015 to 51.8% in 2020 (as shown in Figure 2). In addition, the report also pointed out that with the continuous optimization of the network environment and the continuous popularization of intelligent collection, the number of users of Internet mobile phones is also increasing, and this number far exceeds the utilization rate of desktop computers and laptops [1]. The mobile phone penetration rate increased from 41.8% in 2015 to 90% in 2015.

Big data refers to a data group whose size exceeds the capture, storage, management and analysis capabilities of traditional database software tools. At present, people use it to describe and define the
massive data generated in the era of information explosion, and name the related technological development and Innovation [2]. Victor said in the book The Age of Big Data: "If you are a person, if you refuse, you may lose your life; if you are a country, if you refuse the era of big data, you may lose the future of this country and a generation. The future of man". In the era of big data, people's views and decisions on things no longer rely solely on past experience and subjective judgments, and they are more inclined to mine and analyse massive amounts of data. In the field of physical education, the analysis of big data can better understand the learning of students on a personalized level, analyse the characteristics of students, and teach students in accordance with their aptitude according to the differences between students, so that students become the main body of learning and improve the effect of student learning.

2. The application status of big data and data mining in college physical education

2.1. Universities
Basically, all have basic data facilities that can satisfy school management and teaching. However, the operation and application capabilities of these facilities are relatively limited and cannot be compared with those of governments and large companies with high-quality large data sources. Educational big data and data mining values are still rarely recognized in universities [3]. Most colleges and universities do not have the professional and technical personnel and equipment conditions required for the application of big data in education, and have not formed a complete and unified data platform. Teachers and students have insufficient investment in cultivating big data application awareness.

2.2. Physical education teachers
Most physical education teachers are rather vague about the concept of big data, and there are certain differences in the application expectations of physical education teachers to physical education big data. There are fewer education teachers who can actively use data and can obtain and cross-analyse a large amount of detailed sports data. Physical education educators It is difficult to filter the massive data information. Fractures in physical education research and application are prone to occur, and it is very necessary to eliminate the barriers of big data in the development of educational research and innovation among physical education teachers.

2.3. College students
The vast majority of college students have mobile smart phones, and nearly half of the students have computers. The school can provide convenient network services, and each department has a room. Most students only use WeChat, QQ, etc. as social tools, and the amount of information they can get is limited [4]. The various platform learning methods provided by big data have not yet become the normal state of student learning, and only a small number of students try to supplement learning. Students are strongly willing to use network resources to learn in the era of big data.

3. The value and help of big data and data mining in college physical education

3.1. Physical education
Physical education is the cornerstone of the development of sports, and there are few big data in its application research. The application of data and data mining brought by the era of big data to physical education will enrich and expand the physical education model, which will have a huge effect on improving students' physical literacy, effectively increasing their participation in physical exercise, and enhancing physical fitness. It can effectively improve the effect of physical education, effectively promote the depth and breadth of knowledge competition between teaching and learners, and improve effective teaching and learning of physical education.
3.2. Physical education and learning
The big data thinking of physical education teachers will greatly change the teaching design of physical education. Through teaching design, students’ learning methods can be changed, so that physical teaching methods and results can be developed and innovated. The application of big data to physical education can satisfy students’ needs. Personalized learning needs.

3.3. Implementation path
To achieve integration, crossover, foundation, and breakthrough of big data in physical education in colleges and universities, schools need to make full use of existing education information technology to achieve leapfrog deployment of technical resources related to big data applications through advanced cloud computing and virtualization technology. Establish a public platform for big data in physical education and a big data operation mechanism in the sports system to realize data sharing inside and outside the school, and experience the changes brought about by big data without barriers.

4. Construction of Evaluation Model of Physical Education Teaching Quality in Colleges and Universities

4.1. Evaluation Index
The construction of the physical education quality evaluation system requires the establishment of multiple evaluation indicators. Whether the evaluation system is reasonable or not, the evaluation indicators need to be tested scientifically. In addition, the construction of the teaching quality evaluation system includes a teaching quality evaluation index system for leaders, teachers, and students [5]. The evaluation index system consists of first-level indicators and second-level indicators. The first-level indicators include teaching preparation, teaching process, and teaching effect. The second-level indicators include pre-class preparation, teaching plan writing, classroom routines, teaching attitudes, teaching organization, and teaching. Methods, exercise load, exercise skills, and physical fitness are 9 indicators.

4.2. Discretization of teacher questionnaire data
By issuing questionnaires to 9 college teachers, and collecting the questionnaires, the data was sorted. Discretize the evaluation results of each indicator of teacher evaluation in the collected teaching quality evaluation. Among them, "conformity", "comparable conformity", "basic conformity" and "nonconformity" are indicated by 1, 2, 3 and 4 respectively, and the qualitative evaluation results are "excellent", "good", "competent" and "incompetent" respectively Use 1, 2, 3, and 4. As shown in Table 1.

|   | C1 | C2 | C3 | C4 | C5 | C6 | C7 | C8 | C9 | Qualitative evaluation |
|---|----|----|----|----|----|----|----|----|----|------------------------|
| 1 | 3  | 2  | 3  | 1  | 3  | 2  | 4  | 1  | 3  | 3                      |
| 2 | 2  | 2  | 2  | 2  | 3  | 2  | 4  | 1  | 2  | 2                      |
| 3 | 2  | 2  | 2  | 1  | 1  | 1  | 1  | 1  | 2  | 2                      |
| 4 | 2  | 4  | 2  | 3  | 3  | 3  | 4  | 4  | 4  | 4                      |
| 5 | 1  | 2  | 1  | 1  | 2  | 2  | 1  | 1  | 1  | 1                      |
| 6 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                      |

4.3. Determination of the weight of the teaching quality evaluation index
The weight degree reflects the proportion of the index factor in the evaluation process, so the weight degree of the evaluation index affects the whole teaching quality evaluation result. At present, the determination of the weight degree mainly relies on methods such as subjective scoring by experts, analytic hierarchy process and fuzzy statistics. The traditional weight determination method mainly
relies on experience and subjective judgment, which easily causes the evaluation results to be inconsistent with reality. Rough set theory only uses the information provided by the data itself when dealing with inaccurate data, without any prior knowledge, so it can overcome the shortcomings of other weight determination methods that rely too much on experience and subjective judgment, and make the results more objective [6]. Therefore, it is more scientific to determine the weight degree through rough set theory. In rough set theory, a given information system expression $S = (U, A, V, f)$, where $A = C \cup D$ and $U$ are the universe of discourse, $C$ is the conditional attribute set, and $D$ is the decision attribute set $C \cup D = \Phi$. The importance of the attribute $\text{Sig}_A(a)$ (the importance of the attribute $a \in A$ in $A$) can be judged by a formula

$$\text{Sig}_A(a) = \sum_{i=1}^{n} \frac{|a| \cdot |U - a|}{|U| \cdot (|U| - 1)}$$

Suppose information system $S = (U, A, V, f)$, then the weight of attribute $a_i \in A \{a_1, a_2, ..., a_n\}$ is defined as follows

$$w_i = \frac{\text{Sig}_A(a_i)}{\sum_{i=1}^{n} \text{Sig}_A(a_i)}$$

Where $i = 1, 2, 3..., n$. The index weight degree obtained by calculation is shown in Table 2.

| Table 2. Comparison of index weights of college physical education evaluation (teacher evaluation) |
|-----------------------------------|----------------|----------------|----------------|----------------|
| First level indicator             | Weight (expert) | Weight (rough) | Secondary indicators | Weight (expert) | Weight (rough) |
| Teaching preparation              | 0.1            | 0.17           | Preparation before class | 0.05           | 0.08           |
|                                   |                |                | Lesson plan writing    | 0.05           | 0.09           |
|                                   |                |                | Classroom routine      | 0.1            | 0.07           |
|                                   |                |                | Teaching attitude      | 0.1            | 0.09           |
| Teaching process                  | 0.7            | 0.62           | Teaching organization  | 0.2            | 0.19           |
|                                   |                |                | teaching method        | 0.2            | 0.19           |
|                                   |                |                | Exercise load          | 0.1            | 0.08           |
|                                   |                |                | Motor skills           | 0.1            | 0.08           |
|                                   |                |                | physical fitness       | 0.1            | 0.13           |

It can be seen from Table 2 that there is a certain difference between the expert scoring evaluation weight and the weight value calculated by the rough set. From the first level index, the evaluation weight of the teaching preparation expert is 0.1, which is calculated by the rough set theory. The value is 0.17, indicating that the importance of the teaching preparation phase in the whole physical education quality evaluation should be improved.
5. The path of college physical education reform in the context of big data

5.1. Pre-judge the allocation of teaching resources through big data analysis

Through the technical support provided by big data, various sports projects carried out by colleges and universities can be analyzed separately from the interests of students, the average time willing to invest in sports, the basic physical requirements of students, and the ratio of male to female students in school. Start, and then comprehensively analyse the actual reasons for popularity and unpopularity, optimize the content and development methods of sports events, and make reasonable arrangements in advance for the activity venues, teachers in charge, and equipment configuration to maximize the development of resources. For example, colleges and universities currently promote badminton, volleyball and other sports that are widely and highly popular with students. They have the advantages of low requirements for personal comprehensive quality, low difficulty in getting started, and no special restrictions on the choice of venues, which can effectively mobilize students [7]. Learning interest and participation. When carrying out badminton courses, you can take advantage of the school’s basketball courts and football fields to carry out activities. When teaching students, teachers can arrange teaching tasks according to the specific conditions of the students, such as good physical fitness and already Students who are proficient in swinging, gripping, serving and other techniques can appropriately increase the practice of running and jumping, blocking, swinging and other large-volume movements; students with average physical fitness or who have not mastered badminton operation skills can practice relatively simple Serve, bump, and catch the ball. Adopting such a teaching method can reasonably allocate teaching resources and improve teaching effects.

5.2. Learning from the advantages of big data and innovating teaching models

At present, in order to solve the bottleneck faced in the regional curriculum reform of colleges and universities, college teachers should combine the advantages of the era of big data, innovate the teaching mode of physical education curriculum, and pay attention to the cultivation of students’ sports literacy. Flipped classrooms, MOOCs, and micro-classes are now an extension of traditional sports classrooms, breaking the traditional classroom time and space limitations, allowing students to freely arrange learning time and places, allowing students to become the main body of the classroom and master the autonomy of learning. Flipped classroom watch teaching videos before class, practice in class, after class, teachers combine the content of big data feedback to give students one-on-one tutoring; MOOC uses online teaching methods to expand students’ knowledge and deepen their understanding of subject knowledge; Micro-class courses are short in time and focused, in-depth explanation of knowledge points for students. On the whole, these three teaching modes are all based on the network, through the collection and analysis of big data information, starting from the interests and learning needs of students, the designed teaching content is vivid and vivid, and the teaching focus is split, online The form is convenient for students to observe key knowledge repeatedly and is more targeted.

6. Conclusion

There are few models and methods that use big data and data mining properly in physical education. In the era of big data, practitioners of physical education should keep pace with the times, have an attitude of actively accepting big data, strengthen their awareness of big data, and form big data thinking. The application of big data and data mining in physical education can effectively improve the effect of physical education, and effectively promote the depth and breadth of knowledge competition between teaching and learners. It can also use a certain data analysis platform to help improve the effectiveness of school physical education. To improve students’ physical literacy, to meet the needs of students to customize sports learning content that they are interested in, it can also greatly improve the scientific research level of physical education teachers, and provide more research ideas and help for teachers’ sports scientific research. This innovative result needs to be recognized by the teaching management departments inside and outside the school. It is recommended that colleges and universities fully realize the opportunities and changes that the era of big data will bring to educational innovation, adopt a
positive attitude towards big data thinking, formulate a long-term plan for the application of big data in education, and issue implementation rules so that the system data of educational institutions at all levels can be realized barrier-free migration and sharing.

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