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Innovative Application of Artificial Intelligence Technology in College Physical Education

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Abstract. Against the background of the new era, the birth of artificial intelligence technology opened a new chapter in human development. Artificial intelligence technology has been developed in many places. The report discusses the application and innovation of artificial intelligence technology in college sports. The first thing people think of artificial intelligence is robots. In fact, it can be said that artificial intelligence can replace human labor. Artificial intelligence is a product of modern technology and cannot be understood unilaterally. For example, the various means of transportation used in people's daily travel is an artificial intelligence that can replace people's walking. Another example is that elevators can replace people on stairs. It is also a type of artificial intelligence, which is not an advanced technology. Product, it is also seen everywhere in people's daily life. Artificial intelligence is a synthesis of scientific and intelligent technology created by human beings. It is a scientific technology including computer science, cognition, logic, etc., formed through mutual intersection and integration. In recent years, artificial intelligence has achieved considerable development, but there are still a series of unsolved problems, and the development of artificial intelligence is still very long. This article studies what artificial intelligence has facilitated and changed the physical education in colleges and universities, and what changes have taken place in the teaching mode are all worthy of our thinking. As a result, artificial intelligence technology is convenient for teachers and students in teaching. Let's take a look at how to innovate.

Keywords: Artificial Intelligence Technology; College Sports; Innovative Applications; Physical Education

1. Introduction

Artificial intelligence has two forms of knowledge and technology. Because the form of technology expresses the externalization of the form of knowledge, people often feel the influence of its technological form more intuitively in production and life [1]. For artificial intelligence products, people first pay attention to functions such as facial recognition functions during security confirmation based on relevant technologies such as facial image collection, facial positioning, facial recognition pre-processing and identity confirmation. The realization of the use and, after this technical means, accumulated relevant theoretical knowledge for decades. If there is no continuous update and



breakthrough of artificial neural network knowledge, there will be no deep learning technology-led technology that supports the realization of facial recognition functions [3].

Here, we mainly analyze the profound impact of artificial intelligence technology on human production and life [4]. With artificial intelligence technology as the background, the university's education evaluation system is re-established, and the on-off-line classroom of sports is organically integrated, and the various processes of sports activities are integrated more systematically. It can also be used for college students after school. The body movement data is integrated into the statistical system. Through relevant analysis, the individual physical strength of the students can be more perfectly grasped, and the education content can be formed according to the goals, and the care and quality of the students' participation in sports can be improved. Under the guidance of the evaluation system, use richer teaching methods to increase the depth of sports reform, and through corresponding optimization, seek the development of lifelong teaching activities that meet the requirements of sports concepts, and improve students' lifelong understanding of sports. [5] The combination of college physical education and artificial intelligence technology produces different effects. Specific to college sports volleyball teaching, relying on traditional teaching methods alone can no longer meet the needs of teaching [6].

First of all, due to the relatively complex technical structure of volleyball, a series of complex actions can be completed instantly [7]. Therefore, the requirements of volleyball class for teachers are very "strict"[8]. As a physical education teacher in colleges and universities, especially the older and poorer teachers, it is difficult to accurately, accurately, and timely demonstrate every action link of volleyball technique to students. Therefore, many volleyball teachers always use their strengths and avoid weaknesses when formulating teaching and training plans [9]. Over time, it will definitely affect the teaching effect. Secondly, volleyball is a sport with high athletic skills and requires good physical fitness. Modern intelligent information technology supports volleyball education not only in line with the psychological characteristics of modern college students who are pursuing knowledge and innovation, but also in the students' "exhaustion" and "fear of learning" to build "the desire to learn" and "the desire to learn" "The jumping bridge. Interest in learning can increase the enthusiasm of learning [10]. Modern information technology enters the volleyball education classroom, "invite" excellent volleyball players and excellent coaches, which greatly mobilizes students' interest in learning and stimulates enthusiasm for training. Make full use of the advantages of multimedia pictures, texts, sounds and shapes to create an active classroom atmosphere, increase students' interest in learning, open up new ideas for students, cultivate students' thinking and imagination, and use their potential.

2. Algorithm Establishment

2.1. The Algorithm Of Financial Misjudgment Rate

Bloom Filter allows several errors, saving a lot of storage space. Due to the limited recognition rate of the Bloom filter, the accuracy of similar algorithms varies with the size of the Bloom filter itself. The larger the Bloom filter, the higher the accuracy, and the greater the storage space consumption. When all N elements of the set $s=(x_1, x_2, \dots, x, d)$ are mapped into m-bit arrangement by k hash functions, the calculation formula for the probability P that the arranged specific bit is still 0 is as follows:

$$p' = \left(1 - \frac{1}{m}\right)^{kn} \approx e^{-nk/m} \quad (1)$$

Where $1/m$ is the probability value of a random hash function to select a specific bit, $(1-1/m)$ is the hash calculation once, but this bit shows the probability of not being selected. To completely match the set S, $1/n$ hash calculation must be performed. Here is a general approximate calculation of e.

As shown in formula (2):

$$\lim_{x \rightarrow \infty} \left(1 - \frac{1}{x}\right)^{-x} = e \quad (2)$$

Let β be the proportion of size 0 in the array, then the mathematical expectation of β can be expressed as $E(\beta)=P'$. For the convenience of calculation, here, let, when the value of β is known, the error rate is:

$$(1 - \beta)^k \approx (1 - p')^k \approx (1 - p)^k \quad (3)$$

Among them, $(1-\beta)$ is the ratio of size 1 in the bit array, which means that k times of hashes just select the area of 1, therefore, the size of the false positive rate f can be calculated as (where m is the number of bits in the array, n is Number of elements):

$$f = (1 - e^{-nk/m})^k \quad (4)$$

2.2. SOH Prediction Algorithm

Define the function expression:

$$y_j = f\left(\sum_{i=1}^3 w_{ji}^1 x_i + b_j\right) = \frac{1}{1 + \exp\left[-\sum_{i=1}^3 (w_{ji}^1 x_i + b_j)\right]} \quad j = 1, 2, \dots, 5 \quad (5)$$

The predicted SOH output is:

$$Oy_{SOH} = g\left(\sum_{j=1}^5 w_j^2 y_j + b\right) = \sum_{j=1}^5 w_j^2 y_j + b \quad (6)$$

The output response is deviated from the actual predicted value output. The error value is as follows:

$$\delta_k = (Oy_{SOH} - Y_{SOH}) Oy_{SOH} (1 - Oy_{SOH}) \quad k = 1, 2, \dots, 5 \quad (7)$$

The correction formula is:

$$w_j = w_j + \eta y_j \delta_k \\ j = 1, 2, \dots, 5; k = 1, 2, \dots, 5 \quad (8)$$

The full value correction formula is:

$$w_{ji} = w_{ji} + \eta y_i (1 - y_i) \sum_{k=1}^5 w_{ji} \delta_k \\ i = 1, 2, 3; j = 1, 2, \dots, 5 \quad (9)$$

2.3. Literature Data Method

By consulting many monographs on pedagogy, school physical education, multimedia teaching application, etc. Use the China Academic Journals Network, a key university library information retrieval system and China Knowledge Network to retrieve 100 related sports journal articles in the past 5 years. Classify and analyze the obtained data to fully understand the research status and development trends of this research field.

2.4. Questionnaire Survey Method

In order to better understand the current status of the application of modern artificial intelligence information technology in volleyball teaching in a few colleges and universities, according to the content and purpose of this research, consult a large number of relevant materials and consult relevant experts to design a questionnaire. After the first draft of the questionnaire is drawn up, Asked relevant experts to conduct evaluation and analysis, and made many revisions on the basis of comprehensive analysis of feedback materials, and finally designed a questionnaire (including teacher questionnaire and student questionnaire) on the application of artificial intelligence technology in college physical education.

3. Modeling Method

Optimal hash function model

The specific stages of the algorithm are as follows. (1) Initialize the hash table, use all file perception algorithms, perceive the repeated data in the big data with a single file as a unit, and calculate the hash value of the file respectively. (2) Compare the obtained hash function value with the value stored in the hash table. If the same value is consistent, the file will be replaced by the pointer of the stored file, if not, the file will be saved. (3) Calculate the similarity between the data objects according to the Hamming distance and cosine similarity formula. If the two are the same, replace the file with a pointer to the stored file; if the values of the two are not the same, the file is Store, update the hash table at the same time, and add the hash value of the new file.

Bloom filter uses multiple hash functions to map the collection to the bit array, and there is a certain misjudgment rate at the same time, so it is required to select the optimal number of hash functions to minimize the error rate during element query. If there are many hash functions used, when querying an element that does not belong to the set, the probability of getting 0 is greater; on the other hand, if the number of hash functions is small, there are more 0 in the bit array. The optimal number of hash functions can be determined according to the misjudgment rate formula $f = (1 - e^{-nk/m})^k$. Calculation. Here, let $g = \ln(1 - e^{-kn/m})$, When the value of g is the smallest, the value of f is also the smallest. make $p = e^{-nk/m}$, At the same time, transform g and write it in the following form:

$$g = -\frac{m}{n} \ln(p) \ln(1-p) \quad (10)$$

The derivation operation is performed on both sides of the equal sign of formula (1), and the result is shown in formula (2):

$$\frac{\partial g}{\partial p} = -\frac{m}{n} \left(\frac{\ln(1-p)}{p} - \frac{\ln(p)}{1-p} \right) \quad (11)$$

$$\frac{\partial g}{\partial p}$$

At this point, let $\frac{\partial g}{\partial p} = 0$, It can be obtained that $p = 1/2$, that is, when $k = \ln 2(m/n)$, g takes the minimum value. At this time, the minimum error rate f is as follows:

$$f = (1/2)^k \approx (1/2)^{\ln 2(m/n)} \approx (0.6185)^{m/n} \quad (12)$$

In addition, P is the probability that a bit in the bit array is still 0, that is, $p = 1/2$ corresponds to half of 0 and 1 in the bit array.

4. Evaluation Results and Research

The teaching method is the sum of various measures, methods and means used by teachers in teaching activities in order to achieve the teaching tasks and goals of a period of time. It is an important link between teachers' knowledge transfer and students' learning knowledge. The teaching method of the

volleyball special elective course is how the teacher teaches the basic concepts and knowledge of volleyball to students in the teaching of volleyball, helps students learn and master various skills and techniques of volleyball, promotes students to form a good volleyball awareness, and develops students' volleyball experience. Cultivating students' organizational teaching ability is an important way to improve students' learning efficiency. It plays an important role in publicizing the educational goals and educational topics of the school volleyball special elective subjects. A questionnaire survey was conducted on the selected teaching methods for teachers of the volleyball special elective course in a province's colleges and universities. The selection of the teaching methods for the volleyball special elective course teachers of a province's colleges and universities is shown in Figure 1. It can be seen from the figure that the use of artificial intelligence in college physical education can produce great benefits.

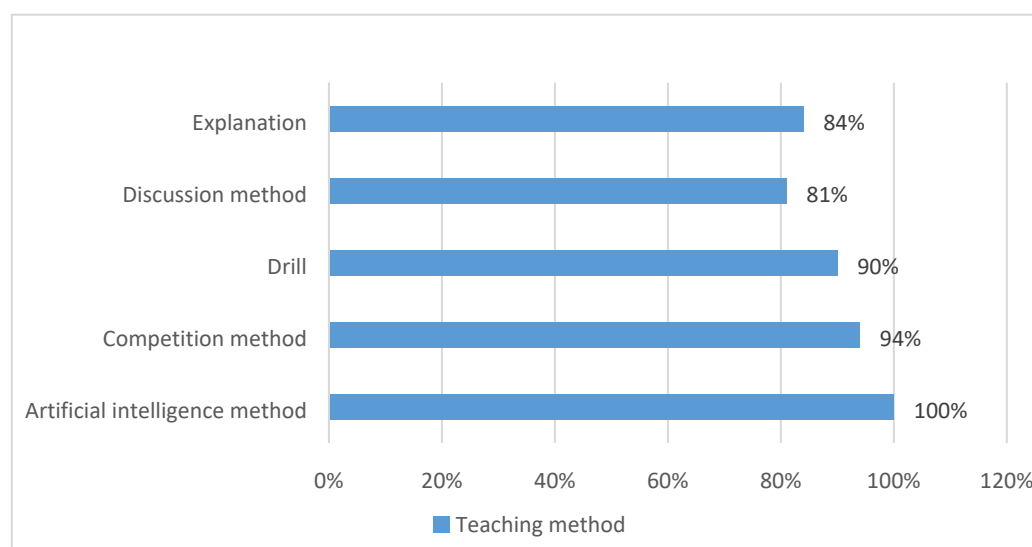


Figure 1. summary of teaching methods in Colleges and universities in a province

In addition, the teaching methods of volleyball special elective course were investigated by questionnaire, and the statistical analysis showed that figure 2. It can be seen from Figure 2 that the former teaching methods are no longer available. Now, it is necessary to innovate in order to make the physical education teaching in Colleges and universities go further and further. The traditional teaching method has not played a positive role in the teaching of new volleyball techniques and tactics. It is also a choice made by front-line teachers from their teaching experience for a long time. But the teaching environment of different periods, the characteristics of students are different, especially now the students are very strong personality and creativity, like to contact with new things, lack of interest in the boring traditional teaching methods. This requires teachers not only to combine the basic requirements of volleyball skills and tactics, but also to combine the psychological characteristics of students, in the teaching of traditional teaching methods and new teaching methods, to stimulate students' interest in active learning volleyball, so that students have the interest of autonomous learning.

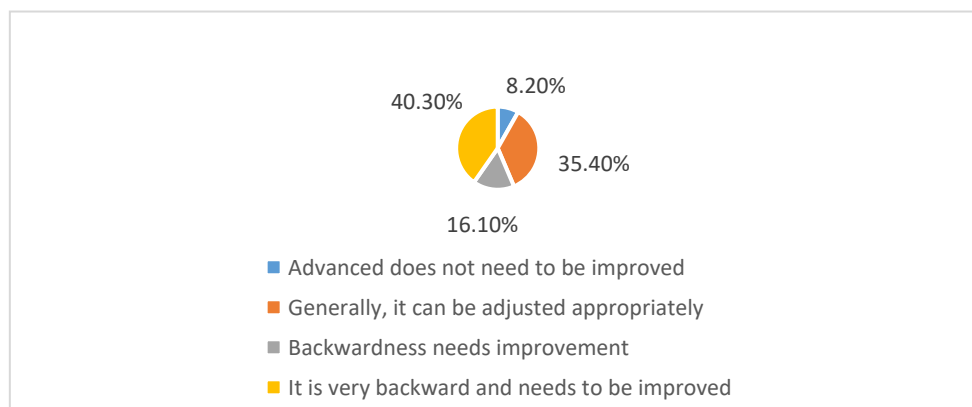


Figure 2. Teachers' views on teaching methods

The comprehensive application of a variety of evaluation methods and methods can also enhance students' interest in learning. In the evaluation process, the selection function, incentive function and development function should be strengthened. The progress of students should be included in the evaluation content. At the same time, the cultivation of students' team consciousness should be emphasized according to the characteristics of volleyball. As shown in Table 1:

Table 1. the proportion of each evaluation in the final grade

	Proportion of final grade	Evaluation subject
Personal learning evaluation	25% of final grade	teacher
Students evaluate each other	5% of final grade	Fellow members
Students' self evaluation	5% of final grade	own
Learning team evaluation	15% of final grade	teacher
Final exam	50% of final grade	teacher

It can be seen from table 1 that the final score still accounts for the main score. In the evaluation, attention should be paid to the learning effect and reaction of students, so it requires frequent communication between teachers and students. The evaluation results or other situations can be fed back to students through correspondence, so that students can further improve. Students can also take the initiative to write to teachers. Or through the establishment of Q group, telephone and other forms of communication.

5. Conclusion

As human social activities, science and technology will inevitably affect other social activities. All the development of science and technology is reflected in promoting the transformation of economic development mode, the change of social management methods, the improvement of human personification ability and level, and the improvement of cultural communication. Educational methods. As Engels said in Marx's tomb, "from Marx's point of view, science and technology are the driving force and revolutionary force of history." The fourth scientific and technological revolution that is now erupting focuses on artificial intelligence technology. Artificial intelligence technology has been used in a considerable part of human society and will be used in the future. Its application will inevitably have a great impact on human production and life, and bring great changes to the face of human society. After years of discussion, each university has established a sports organization and management system with its own characteristics and era brand. Physical education and management emphasize the nature of "people-centered", and all educational management provide services for students. In sports management, we should establish network use, sports website, online learning platform or app learning software.

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