Research on the Innovative Application of Music in the Reform of Physical Education under the Analysis of Big Data

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Abstract: With the rise of the Internet and big data, new opportunities and challenges have been brought to physical education. Rich teaching methods can enhance students' enthusiasm for participating in physical education classes and increase their interest in learning. The changes in the rhythm, strength, and ups and downs of music can be easily combined with sports, and this brings new ways of reform to physical education. This paper explores the method of applying music to the reform of physical education teaching by means of big data analysis. It is found that music can significantly relieve fatigue during exercise and improve the willingness to exercise. The application of music in physical education provides a new idea for the reform of physical education.

1. Introduction

The rise of the Internet and big data has brought about great changes and innovations in physical education. At the same time, music plays an important role in daily life. With the in-depth research on the reform of physical education, the innovative application of music in physical education is gradually being paid attention to [1]. The application of music in physical education has also been appreciated by students. The integration of music and physical education not only enriches the teaching content, but also stimulates students' interest in learning [2]. In recent years, many researchers have focused on the combination of music and sports and conducted a lot of related research [3, 4]. The research results show that listening to music during exercise can improve exercise ability and improve movement coordination. It also increases personal self-esteem and self-confidence, and also increases people’s motivation to participate actively in fitness [5]. Under the background of deepening teaching reform, using music in physical education and sports training has become one of the research priorities of sports teaching reform researchers. The application of Internet and big data brings new opportunities and challenges to physical education. Big data technology can be used to extract rules from mass data and apply it to the reform of physical education teaching to better discover the direction of teaching improvement. Meanwhile, with the development of mobile Internet, teaching interaction between students and teachers, students' personal preferences, academic achievements and living conditions can be quickly collected and integrated. The arrival of the era of big data also provides technical support for the application of music in physical education. By means of big data analysis, the promotion effect of music on physical education teaching can be obtained.

2. Music plays an important role in physical education

In physical education, the cultivation of music value is very important to improve the academic level of students majoring in art in physical education. Music has rhythm, melody, and dynamic characteristics. Through music on the brain cortex stimulation can stimulate students' learning interest, active classroom atmosphere, edifying sentiment, can help students improve the coordination of movement, improve learning effect. In addition, music helps to eliminate fatigue, conditioning and relaxation. Therefore, physical education teachers can combine the content of physical education and students' reality and choose appropriate music to improve the quality of

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physical education. Therefore, physical education teachers can combine the content of physical education and the conditions of students to select the appropriate music to improve the quality of physical education.

2.1. Music induces students' interest in sports

Music can induce students to participate in sports learning interests, and also has a great impact on the physical and psychological aspects of students. The cerebral cortex will be excited when listening to dynamic music while exercising. The excitement generated will help to quickly establish a temporary connection with other relevant action sites. This is conducive to the integration of sports and music. Therefore, physical education teachers can easily mobilize the enthusiasm of students to learn sports, and the driving force for learning new sports actions. With the music of beautiful rhythm and melody, create a pleasant scene for the students to learn more quickly into the new movements. According to relevant research reports, listening to music can improve people's heart rate in the shortest time, accelerate heartbeat, promote blood circulation, increase blood supply in the body, and help students quickly enter the working state.

2.2. Music is good for students to quickly master the rhythm of exercise

The earliest application of music in sports is its rhythm, and music is very helpful in improving students' sense of rhythm. For example, for those who have a good sense of rhythm, the formation of the rhythm of the exercise requires only a small amount of training. On the contrary, for those with poor music rhythm, it takes more time to train. Therefore, physical education teachers let students listen to music with different rhythms in physical education and interclass activities, which will help cultivate students to develop a better sense of dynamic rhythm.

2.3. Music is good for relaxing after exercise

Music is used as a means of recovery, with certain special effects. When listening to cheerful and melodic music, the physical and psychological fatigue of the students can be alleviated, which makes them feel happy and refreshed. At the end of the physical education class, students are fatigued both physically and psychologically. Therefore, the teacher should play some soft and beautiful music to the students in the relaxation part of the physical education class. The remarkable effect is that the excitability of the students' cerebral cortex gradually declines. And the attention of the students is also transferred, so that the body's central nervous system transitions from a tense state to a quiet state. Doing exercises with the slow and beautiful accompaniment of music can promote students' blood circulation, adjust their breathing, increase the amount of oxygen they take in, and help the decomposition and elimination of lactic acid, which can not only relieve physical fatigue, but also eliminate the excessive tension in spirit. In addition, listening to music before exercise can also control emotions.

The human brain can improve the function of the central nervous system under the stimulation of different melody music, and also stimulate the cerebral cortex. Under the accompaniment of music, physical training can improve students' sense of rhythm and complete the coordination of movements, so that movements and music can be integrated. The combination of sports and music will be more attractive and will help to increase students' interest in actively participating in sports training. In addition, after carrying on the big intensity load training, can play some soft music, let the student listen to make its mood comfortable, the spirit is joyful, at the same time the muscle also gets relaxed, and eliminates the fatigue, for the next stage of training to make full preparation.

3. Application analysis of big data

With big data analysis, the influence of music in physical education teaching can be presented through the intervention of relevant mobile devices. The amount of exercise and the accuracy of the movements of the student in sports are monitored by sensors in the wearable device. The bracelet can measure the correct rate of motion of the student. The questionnaire was used to obtain the students' experience in the process of physical education with and without music. Taking 2480

students as samples, the experiment on the influence of music on physical education was carried out.

There are 6 sampling points throughout the process, from the beginning of teaching to the end of the class. In this process, the accuracy of the student's movements is detected by the wristband device. And students fill out the questionnaire to give satisfaction feedback. The whole process is carried out twice, divided into experimental groups and reference groups. The experimental group contained music consistent with the rhythm of motion. Another group, the reference group, does not have music throughout the process. In the case of running, for example, the number of students who felt relaxed during the run at six sampling points was obtained. Fig.1 shows the number of students who feel comfortable running with music and without music.

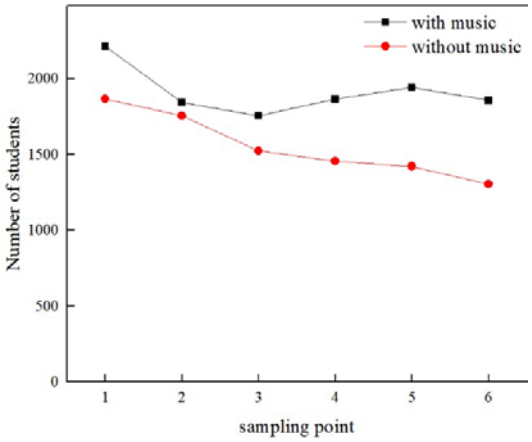

Fig.1 The number of students who feel relaxed during running

As can be seen from the Fig1, students have a strong willingness to run when there is music and no music at the beginning of the run. The number of students who feel relaxed as the run progresses begins to decline. In the beginning, due to the presence of music in the experimental group, more students were willing to run. In the reference group without music, students' willingness to exercise decreased gradually as the course went on. This is because as the amount of exercise increases, students begin to feel tired gradually. In the music group, the number of students who felt comfortable at the first to third sampling points decreased. The number of students who felt relaxed after the third sampling point gradually increased. This is because, with the progress of exercise, music rhythm and exercise combination can eliminate students' sense of fatigue. Overall, the number of students who felt comfortable running with music was significantly higher than without music. It shows that music can greatly reduce the fatigue caused by exercise. Music can bring more relaxation to the exercise process. It shows that the application of music in physical education teaching can better improve students' sports intention.

Taking the hurdle movement as an example, the influence of the music of the learning process on the accuracy of the action is detected. Figure 2 shows the change of the accuracy of the action of the training process.

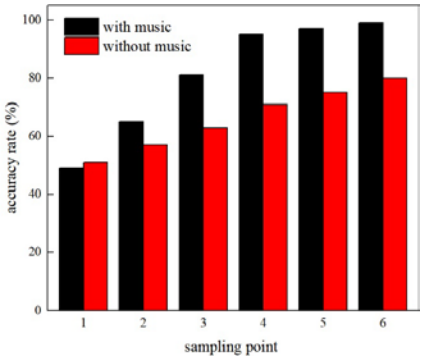

Fig.2 Hurdle action accuracy

It can be seen from the figure that as the course progresses, the accuracy of the action gradually increases. As the learning progresses, the proficiency to the movement gradually increases. Through repeated training, the accuracy of the movement can be improved. It can be seen from the comparison between the experimental group and the reference group that the accuracy of the motion improvement when there is music exists is higher than that of no music. When music exists, the rhythm of music can be combined with hurdle movement, which enables students to grasp the characteristics of movement in motion more quickly. That is, when music is applied to physical education, students can learn to exercise more quickly.

4. Conclusion

The lack of sufficient teaching methods is a short-term breakthrough for physical education classes. Good teaching methods can improve students' enthusiasm for participating in physical education and improve their interest in learning. Relevant literature and survey results show that appropriate music melody can improve the teaching effect of physical education. Most researchers believe that adding music to physical education can enhance students' athletic mood and ability, can cultivate students' sentiment, and have a positive impact on students' physiology. This paper explores the ways in which music is used in the reform of physical education under the analysis of big data. Through the monitoring of the accuracy of the movement and the willingness to exercise during the student's movement, the music can greatly alleviate the fatigue during the exercise and enhance the willingness to exercise. At the same time, music also helps to improve the speed of the action. It provides a new reference for the application of music in the reform of physical education.

References

[1] Simpson,SD,Karageorghis CI.The effects of synchronousmusic on 400-m sprint performance[J].Journal of Sports Sciences,24(10):1095-1102.

[2] Stevens MJ,Lane AM.Mood-Regulating Strategies Used By Athletes[J].Athletic Insight,2001，3(3)：1-12

[3] Kretschmann R, Grabowiecki U V. Sport and art: a view on the worldwide and connecting area from the perspective of sports science - or: about the convergence of two worlds.[J]. Physical Culture & Sport Studies & Research, 2012, 55(1):5-16.

[4] Macnamara B N, Hambrick D Z, Oswald F L. Deliberate practice and performance in music, games, sports, education, and professions: a meta-analysis.[J]. Psychol Sci, 2014, 25(8):1608-1618.

[5] Dawes N P. Dynamic Relations Between Parents' Behaviors and Children's Motivational Beliefs in Sports and Music[J]. Parenting, 2010, 10(2):97-118.