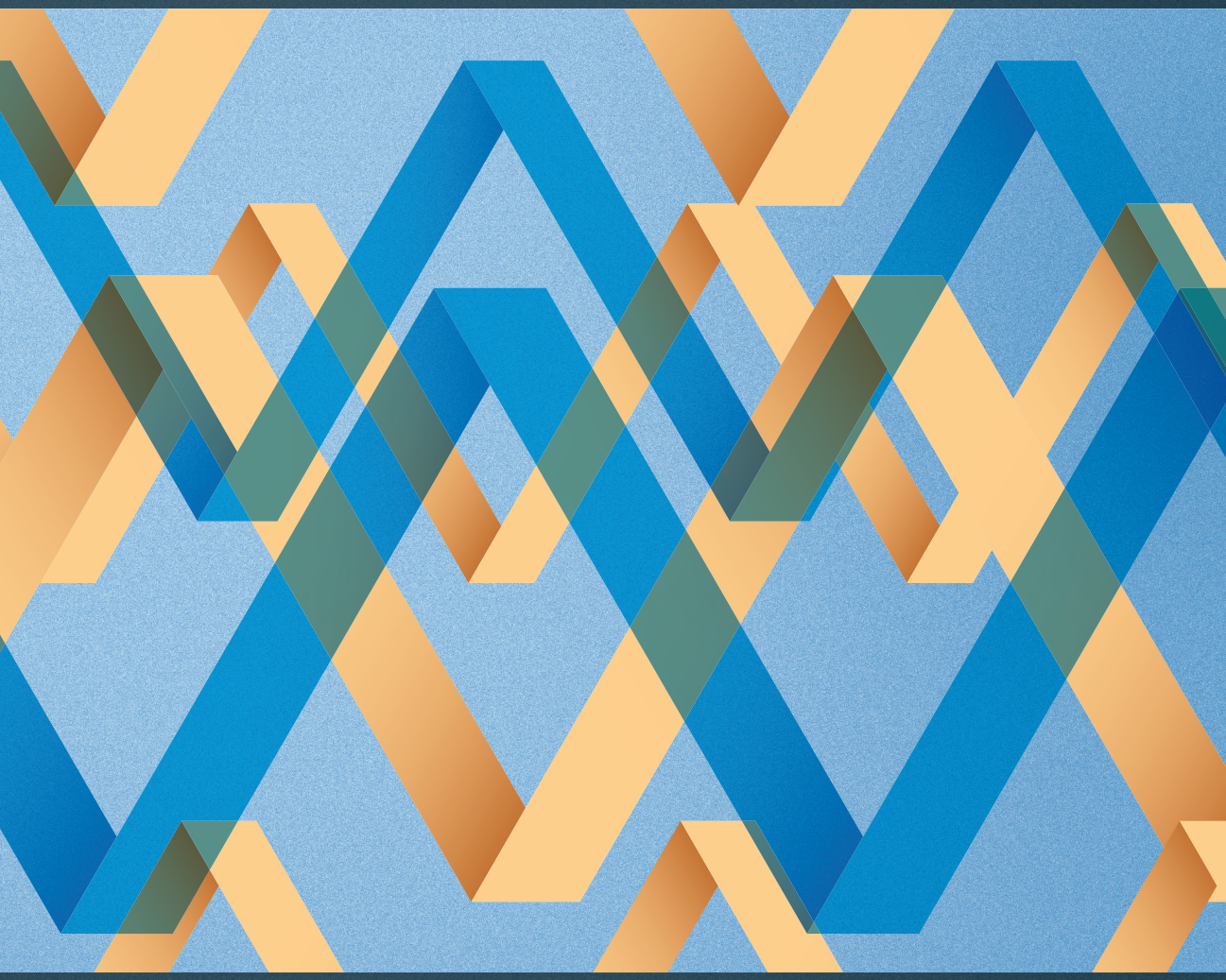
Advances in Sports Engineering and Technology 2

Sports Technology and Engineering



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Sports Technology and Engineering

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Preface

The 2014 Asia-Pacific Congress on Sports Technology and Engineering (STE 2014) was held December 8–9, 2014, Singapore. STE 2014 brought together experts from a range of disciplines and the intention was to discuss problems and solutions, identify new issues, and shape future directions for research in these areas, as well as help industrial users apply advanced techniques.

The present volume contains the selected papers from many submissions for this conference and provides up-to-date, comprehensive and worldwide state-of-the art knowledge in this field. All papers included in this volume have already undergone strict peer-reviewing and been accepted for publication. We hope this collection will not only provide the reader with a detailed insight into the latest advances but also provide the researchers a valuable background or reference in this field.

The conference which was attended by researchers from 20 countries served as a forum to promote and exchange the latest theoretical and applied advances in Sports Science, Computer Science, Computer Science in Sports, and Sports Engineering.

STE2014 covers a wide range of topics: Coaching and Feedback, Training and Testing, Sports Biomechanics, Virtual-Reality, Computer Games, Computer Vision, Soft-Computing, Computer Networks, Engineering Exercise and Health, Computer-Aided Physical Education, Sports Instrument Equipment Research, Computer Applications in Sport, Sports Statistics, Sports Measurement and Evaluation, and Sports Equipment.

We would like to take this opportunity to thank many people. First and foremost we want to express our deep appreciation to the invited keynote speakers, invited session chairs, invited session organizers and reviewers for their efforts and kind help in this congress. Final thanks go to all authors and participants of STE 2014 for helping to make it a productive and interactive meeting.

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Section 1: Sports science

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A comparative study on metabolic characteristics of partial skeletal muscle oxygen and gas exchange rates by near-infrared spectroscopy

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ABSTRACT: The article performs a study on the relative change between inflection points of Respiratory Quotient (RQ) and HbO_2 in skeletal muscle during the process of increased intensity sports, in which the occurrence priority and interval regularity are compared based on time, and the physiological mechanism of synchronisms is analyzed. The results show that the inflection point of RQ is relatively changing to ΔHbO_2. That means there is a time delay in RQ. The delay in VO_2 and VCO_2 relative to HbO_2 is affirmed in the single-factor variance analysis test.

Keywords: near-infrared spectroscopy; inflection points of respiratory quotient; HbO_2

1 INTRODUCTION

It is an important part of scientific training for athletes to use biochemical criteria to observe the athletes' reaction towards exercise load, monitor the reactions scientifically, and adjust the exercise load accordingly. By measuring and analyzing the metabolic function of skeletal muscle oxygen, a coach will be able to know the athletes' functioning condition more accurately and timely while they are exercising and schedule the training plan reasonably, helping them avoid burnout and improving their sport performance. The promotion of NIRS detection and skeletal muscle oxygen detection index will improve continually the automatic operation and evaluation of body function detection, and expedite the speed of information feedback. Also, it can help to solve a series of current issues like the domestic physiological and biochemical tests and evaluation indexes of the physical function of lettermen, which are subject to the sampling and testing methods.

As an important content in the field of Biomedical Photonics, NIRS is based on the absorption spectrum of all major chromophores (like HbO_2, Hb) in living organisms. It incorporates the propagation law of light through the tissue and utilizes the penetrability of near-infrared light through the tissue and the feature of the HbO_2 and Hb in skeletal muscle tissue having different absorption spectrums towards the near-infrared lights with different wavelengths, to measure the relative change of the amount of muscle oxygen while the skeletal muscle is exercising under different intensity, which provides a convenient and reliable new test metric for clinic and research. Due to the fact that this measuring method is safe, reliable, continuous, timely, speedy, etc, so it has an extensive research and application prospect.

Since the near-infrared spectroscopy can achieve the real-time monitoring of the change of HbO_2, Hb, and BV and HbO_2 is like O_2, CO_2, and lactic acid, closely linking with cellular energy metabolism, this experiment applies the latest international research achievement, NIRS technology, to monitor the change of partial skeletal muscle oxygen for male rowers while they are given increased loading training. Also, to make a comparative analysis of the metabolic characteristics of the gas detected synchronously with the help of this technology, we can discuss the athletes' muscle oxygen change while they are training so that a portable and damage-free real-time monitoring method of inflection points of respiratory quotient hopefully can be found finally.

2 EXPERIMENT TEST

2.1 *Experiment subjects*

These 12 volunteers are all excellent male rowers from Wuhan Institute of Physical Education and all proved a healthy condition under the common physical examination. The basic information of the subjects is shown in Table 1.

2.2 *Experimental apparatus*

1. Near-Infrared portable muscle oxygen monitor (3 wavelengths) developed by Huazhong University of Science and Technology, which is

Table 1. Basic information of the subjects ($\bar{x} \pm s$, n = 12).

Age (year)	Height (cm)	Weight (kg)	Training time (year)
18.7 ± 2.83	186.3 ± 5.36	83.8 ± 4.76	5.3 ± 1.36

used to monitor the relative change of HbO_2, Hb, and BV in partial muscle tissue.
2. MAX-II Cardiopulmonary function tester (U.S.A), which is used to monitor VO_2, VCO_2, RQ, etc.
3. CONCEPT-II Rowing Ergometer (Germany), which is used to control the training load and measure the power.
4. One Lenovo laptop, which is used for information collecting and data processing.

2.3 *Experimental procedure and test index*

2.3.1 *Experimental procedure*

CONCEPT-II Rowing Ergometer is used in this experiment to control the training load. Before the test, equipment calibration and resistanceless warm-up must be done. One minute later when it is relatively stable, subjects begin to do incremental exercise on rowing ergometer (CONCEPT-II) with an initial power of 50 W and increase 50 W every 3 minutes until the subjects are exhausted. In order to minimize the error, athletes are asked to take the test at the same period of time in different days. All physical measures of the athletes must be checked before the test, making sure that the subjects are in a healthy status and their motor function is normal.

2.3.2 *Test index*

The 3-wavelength near-infrared portable muscle oxygen monitor is used in this test to monitor the relative change of the HbO_2 amount from subjects' right outward head of quadriceps femoris. Also, MAX-II Cardiopulmonary function tester is used to record synchronously the oxygen uptake, including VO_2, VCO_2 and RQ.

2.4 *Error analysis*

The main source errors in this experiment are listed here: (1) the start-stop time error from different apparatus, which is less than 1 s and can be ignored when it is measured on a time shaft which is up to 2000s; (2) individual difference, which, however, will not influence the accuracy of the result in this experiment since the purpose of this experiment is to discuss the content variation of skeletal muscle oxygen, which is an intra-comparison among many groups of simple sample, not touch upon the horizontal comparison among multi-samples. (3) the data density is different since the data frequency of muscle oxygen is 2.93 Hz and RQ is 0. 067(1/15) Hz. However, this experiment is aimed at discussing the variation tendency of the skeletal muscle oxygen, not looking into the values and quantitative analysis, so the data density will not affect the test a lot.

3 EXPERIMENTAL RESULT

The RQ is equal to VCO_2/VO_2, since this experiment is only concerned about where the RQ is, regardless of its variation tendency, and the rangeability of the VCO_2/VO_2 curve is small, which is in a uptrend like VCO_2 curve and VO_2 curve are, finally causing too many curves going and interlacing and therefore it is adverse to observation, so in this experiment we use VO_2-VCO_2 to draw the curve so that the rangeability will be bigger when the curve is getting closer to zero axis. Also, the VO_2-VCO_2 curve has the opposite variation trend compared to the VCO_2 curve and VO_2 curve, avoiding too many curves going or interlacing, so that which is good for study. The way to find the inflection points of respiratory quotient in the VO_2-VCO_2 curve is similar to the typical VCO_2/VO_2 curve, which is looking for the intersection of curve and the zero axis. This appropriate adaption is made in this experiment under the premise of not affecting the objective accuracy of the result. As shown in Figure 1, the abscissa axis is a time axis, on which the coordinate like 150, 300 is the specific time where the exercise load changes. The 0–150 period is rest period, while the 150–1410 period, totally 7 periods, is the time period for progress load. The after-1410 period is rest period. The upper part of this graph shows respiratory system data where the inflection points of respiratory quotient can be found in the intersection of VO_2-VCO_2 curve and the zero axis. The rest two curves are VCO_2 curve and VO_2 curve, both of which go up as the exercise load increases, during which there are also some plateau periods. The underneath section shows the skeletal muscle oxygen data, from which we can see that the HbO_2 curve also changes relatively as the exercise load increases, during which there are also some plateau periods [8]. However, we can see that from a certain point on, the HbO_2 curve's plateau disappears even when the exercise load is still increasing. This point is called HbO_2 unusual inflection point here.

3.1 *The RQ coaxial curve*

Before the HbO_2 unusual inflection point appears, HbO_2 curve is like the respiratory system curve,

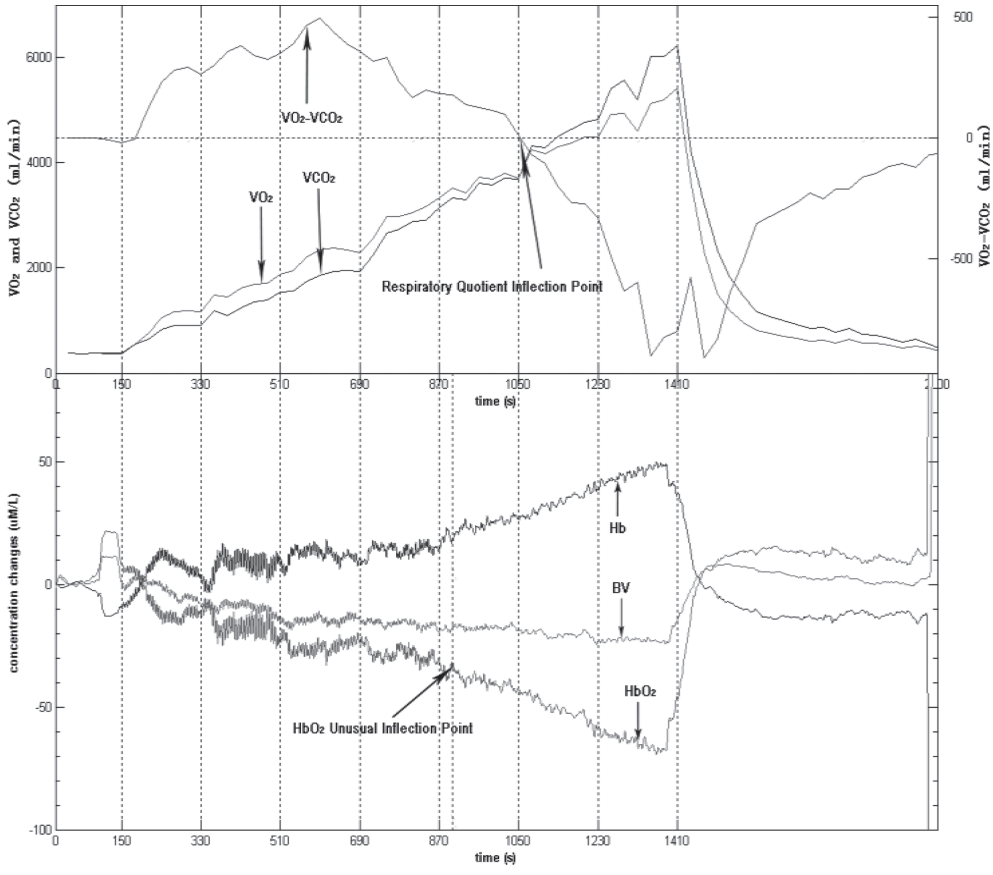

Figure 1. Distributions of Hb, BV, HbO_2, VCO_2, VO_2 and VO_2-VCO_2 based on time.

decreasing step by step as the exercise load increases with some plateau periods during the time. However, after this point, although the HbO_2 curve still decreases as the exercise load increases, plateau cannot be found anymore and the curve decreases linearly. Therefore, we can estimate that this athlete entered the anaerobic status at the time where the HbO_2 unusual inflection point appears, that is to say that the HbO_2 unusual inflection point can represent the traditional inflection points of respiratory quotient. In addition, compared to the inflection points of respiratory, the HbO_2 unusual inflection point appears earlier, that is to say that there is a time sequence between them.

3.2 *Time difference between HbO_2 unusual inflection and respiratory quotient Inflection point*

3.2.1 *Analysis method and data processing*

1. Draw a data graph with all the data sharing a time axis. Then make a horizontal contrast on the graph, finding the intervals where HB and VO_2's upper inflection points are. To make sure the time axis is consistent, we only have to guarantee the location and numerical value of the start and end point of the time axis to be absolute consistent. Roughly decide where the intervals are for HB and VO_2's inflection points respectively, then we can analyze the data in this intervals.
2. Analyze the Interval Data and Extract the Inflection Point Moment. Use the following methods to analyze the data within the intervals: on the data graph, there are certainly two slopes near the inflection point. As shown in Figure 2, the appearance of the first slope is due to the fact that inflection point is between two data so that the data is not completely after the inflection point, at this time this slope cannot objectively reflect the index's rising trend. As for the second slope, since the inflection point is located before two data, so the data is completely after the inflection point.

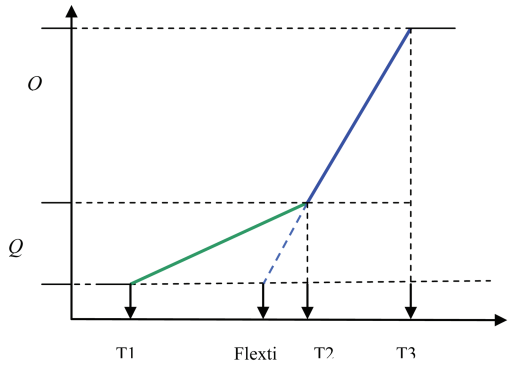

Figure 2. Enlarged figure of the near-inflection-point.

This slope can objectively reflect the rising trend of the index. According to these two slopes, we can figure out the moment where the inflection point is: If the inflection point moment $T = T_2 - X$, then.

$$\frac{X}{Q_a} = \frac{T_3 - T_2}{Q_b}$$

where T_2, T_3 can be read directly from the abscissa data table, Q_a and Q_b can be determined by using the ordinate data table, so we can get the value of the X, that is, the inflection point moment.

3. Calculate the Delay Values of the Four Experiments. Consider setting these four experiments as A, B, C, D respectively, we can extract the Hb inflection point moment TA_2, TB_2, TC_2, TD_2 and VO_2 inflection point moment TA3, TB_3, TC_3, and TD_3 respectively using the method mentioned above. Using these upper inflection points moment to subtract the actual time TA_1, TB_1, TC_1, TD_1 recorded from the experiment, we can get the absolute delay value of Hb, $\Delta TA_1 = TA_2\text{-}TA_1$; ΔTB_1; ΔTC_1; ΔTD_1; the absolute delay value of VO_2, $\Delta TA_2 = TA_3\text{-}TA_1$; ΔTB_2; ΔTC_2; ΔTD_2.
4. Statistical Test. Divide ΔTA_1, ΔTB_1, ΔTC_1, ΔTD_1, ΔTA_2, ΔTB_2, ΔTC_2 and ΔTD_2 into two groups according to their monitoring methods, to do the one-way analysis of variance. Given H_0 is zero-difference absolute delay value from two testing means, we calculate its concomitant probability. If $P > 0.05$, then we can accept H_0 and conclude that there is no delay value between the blood muscle oxygen data and the respiratory data; if $P < 0.05$, then we don't accept H_0 and therefore conclude that there is delayed effect between the bold muscle oxygen data and the respiratory data.

Table 2. Absolute delay of VO_2 and HB.

Group	VO_2 (s)	HB (s)
A	60	26
B	71	18
C	81	9
D	49	33

Table 3. Absolute delay values.

	Sum of Sq.	df.	Mean Sq.	F	Sig.
Betw. groups	3784.500	1	3784.500	26.312	0.002
With. groups	863.000	6	143.833		
Total	4647.500	7			

3.2.2 *Result analysis*

According to the methods mentioned in section 3.2.1 (2, 3), we calculated the absolute delay value of VO_2 and HB as shown in Table 2.

The results of the one-way analysis of variance are shown in Table 3.

According to the analysis described above, we can know that indeed there is a time delay between the blood muscle oxygen data and the respiratory data under the condition of progressive increasing load training. Since this experiment is only based on the difference of monitoring methods as basis for grouping to analyze, we can only analyze from the data to prove the existence of difference between them.

4 ANALYSIS AND DISCUSSION

From the experimental results we can see that the muscle oxygen monitoring system of near-infrared spectrum can detect accurately the change of partial muscle oxygen (HbO_2, Hb, BV) while athletes are exercising. The variation trend of it agrees with the changing trend of respiratory data. Since when people are exercising, the oxygen they take in mainly serves for the muscle movement, so monitoring the partial muscle's parameters described above during exercise to speculate about the respiratory index is feasible.

Meanwhile, by observing the data graph of near-infrared spectrum muscle oxygen monitoring system, we can find out the existence of HbO_2 unusual inflection point [16]. The experiment shows that before the appearance of the HbO_2, the HbO_2 curve steps down as the training load increases, which is

caused by Bohr Effect. The CO_2 and lactic acid produced from tissue in response to exercise will make the HbO_2 dissociation curve move right, which is significant for working muscles to get the oxygen [16–20] and coincide with the respiratory data. During this process, whenever the exercise intensity increases, the HbO_2 curve goes down, which shows that the rate of O_2 consuming by the quadriceps femoris is increasing; during the time where the exercise intensity remains unchanged, HbO_2 also keeps constant, which shows that during the time when the exercise intensity remains unchanged, the rate of O_2 consuming by the quadriceps femoris also keeps constant. The situation changes after the appearance of the HbO_2 unusual inflection point, where the HbO_2 curve doesn't step down anymore as the exercise load increases, instead it decreases linearly, which shows that during the time when the exercise intensity increases and the exercise load remains unchanged, the amount of HbO_2 in the blood of partial quadriceps femoris is decreasing, while when the O_2 supply is abundant and the exercise load keeps constant, O_2 consuming rate by the quadriceps femoris should be sustained [19,20]. However, according to the data graph, the amount of HbO_2 in blood is still decreasing continuously.

The different situations before and after the HbO_2 unusual inflection point show that before the appearance of the HbO_2 unusual inflection point, the organism is in an aerobic exercise status where there is enough O_2 supply, so during the time the exercise intensity remains constant, the supply of HbO_2 is enough for the quadriceps femoris to maintain its consumption of O_2, that's also why in this period, we can see that the HbO_2 curve stays in a horizontal level without any variation trend. After the appearance of the HbO_2 unusual inflection point, however, the organism enters into an anaerobic exercise status where it is in short supply of O_2. At this point, the resultant HbO_2 cannot meet the needs of exercise requirement, so the process of aerobic decomposition is limited here and the anaerobic glycolysis increases. Since at this point the resultant HbO_2 cannot serve for exercise, the HbO_2 cannot maintain its constant level in the blood anymore, instead which is used by the organism once it is produced, that is why the HbO_2 curve linearly decreases after the HbO_2 unusual inflection point. The analysis mentioned above is the theory that the HbO_2 unusual inflection point may represent the respiratory quotient inflection point. As for the specific mechanism, we are still testing and studying.

5 CONCLUSION

During the increased load training, at the beginning stage, the muscle oxygen content decreases slowly with the appearance of plateau sometimes as the exercise load increases step-by-step. Once the exercise load goes up to a heavy intensity, the muscle oxygen content decreases rapidly and the change of the muscle oxygen content between each exercise load lever is obvious. However, within each same load level, the muscle oxygen content changes rather smoothly. Meanwhile, the tested respiratory gases' metabolic variation trend agrees with the relative change of muscle oxygen. Therefore, the relative change of the muscle oxygen content is able to reflect accurately the change of the exercise load. Meanwhile, the muscle oxygen content decreases gradually as the exercise load increases but it won't get close to zero, instead it won't change as the exercise load changes anymore when it goes down to a rather low level. There exists a critical value, that is, the HbO_2 unusual inflection point, which provides a reference to evaluate the athletes' body function.

Meanwhile, during the process of increased load training, the metabolic change of the gas lags behind the relative change of the oxygen content in the muscular tissue, that is, the respiratory quotient inflection point reflected here has a prepositional effect, so the near-infrared spectrum muscle oxygen monitoring system can be more accurate and timely than the respiratory system when it comes to reflect the athletes' anaerobic working status by movement. In addition, it's compact, portable and user-friendly—control characteristics make it possible to assist the current respiratory system to evaluate athletes' real-time body function.

ACKNOWLEDGMENT

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The study on physical education approach of public sports in Fine Art college

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ABSTRACT: The nationwide implementation of "Physical education and health curriculums standard" has been more than ten years. College sports show "all flowers bloom together contention of a hundred schools of thought" prosperity. Wuhan area's physical education in this decade, the school hardware, software has been changed greatly, however, the sports teaching idea could not been updated at the same time, that the practice of physical education has been in trouble, resulting in adverse consequences. To investigate its reason, it is comprehensive, such as history; reality; sociology; school education system. This paper aims to solve some school concept questions, to clarify the relationship between health and physique, interest and culture, to cater to the teacher leading and students as main body relation theory. And it puts forward some measures, like "small-scale District Sports option class", "physical education classes and Sports Association combining", "make full use of school resources", "serious system health test and on the basis of evaluation", for solving the plight of sports teaching practice.

1 INTRODUCTION

During the period of social transition, many domestic Academies of Fine Art build up new campuses and put them into use, the enrollment scale; stadium and gym numbers of Academies of Fine Art have been into geometric multiple growth. Such phenomena as the serious shortage of stadium and gym numbers; the needs of teachers and students can't be met, have gradually become histories. Under the circumstances of totally new physical education, however, how to meet the demands of most teachers and students becomes the urgent task of physical educators' research topic of Academies of Fine Art.

It has been more than ten years, from basic education "physical education and health curriculums standard (the experiment draft)" was put to test in 38 countries in 2001 to be put into nationwide implementation in 2005, during which time, with the active participation of teachers and students' "physical education and health curriculums standard" receive smooth promotion, the reform of physical education show "all flowers bloom together contention of a hundred schools of thought" prosperity. Although there are difficulties and resistance in the process of reform, large physical teachers are now solving all kinds of practice difficulties and problems through reform and innovation with the attitude of ownership. Therefore, theoretically clarifying problems existing in the physical education concept, seeking the way to solve education practice problems, meeting the demands of vast teachers and students have great practical significance. Obviously, physical education reform will involve the school education system; teaching habits of teachers and students and so on. "Reform is to take knife to cut his own flesh", quoted by the vice premier Wang yang. Physical education reform of Academies of Fine Art has a long way to go.

2 SEVERAL ISSUES OF PHILOSOPHY MUST BE CLARIFIED

Academies of Fine Art were in serious shortage of stadium and gym numbers before, under the special historical background of which, physical teachers of Academies of Fine Art adjust measures to local conditions, forming education concept and mode, which accords with its own characteristics, such as "The transition from enhance Physique to improve health"; "The transition from heavy physical exercises to light sport technology" and so on. The renewal of the concept makes up for the difficult position the lack of stadiums and gyms brings on some level.

Education concept having been to form conforms to the practical demands of colleges and universities' physical education at that time. With building new campuses of Academies of Fine Art, the use of new stadiums and gyms improves the phenomenon of lacking stadiums and gyms, satisfies the

basic needs of physical education between teachers and students. Enhanced physical education of Academies of Fine Art must move towards its due education track; meanwhile, the change of physical education environment needs new education concept to meet the needs of teachers and students. Nevertheless, it is hard to change the physical education concept formed over the years in a short time, whether physical teachers or school education concept can't adapt to the education practice problems due to the change of environment. The new physical education environment has conflict with the olds, putting the concept shouldn't have been divided up into opposition, causing serious ideological confusion and influence the quality of physical education practice. In order to clarify several philosophy problems that must be identified, this article does some theory analysis.

2.1 *The issue of health and physique*

"Health" and "Physique" are coincided with each other in essence, both of which are a judgment of the human's quality of life and living condition, regardless of a little bit of difference. Health is an international concept. The World Health Organization defined it as follows: The individual get full state of peace physically, mentally and socially; while the concept of physique is full of Chinese characteristics, closing to "physical strength" in Japan; "fitness" In the West; "physical fitness" in Hong Kong. The content of health is abundant; the definition of health is generalized gradually, almost contains Medicine, psychology, sociology, social psychology, ethics, education and sports science and so on, so pertinence and judgment become more and more difficult.

Considering evaluation to man, health is relatively static while physique is relatively dynamic, the former lay emphasis upon man's life ability; labor ability; combat ability; adaption ability and athletic ability. Athletic ability has great significance in human beings' evolution and development, more than a kind of game ability; competitive ability or a kind of ability that only teenagers or athletes need. Therefore, physique and physical fitness are twinborn, of which the former can more intuitively reflect the value and function of physical education.

2.2 *The issue of catering to the interest and cultivation*

The new "physical education and health curriculums standard" is initiated by several psychological experts, who attach great importance to students' mental feelings and pay attention to catering to students' interests, which is in sharp contrast to the "forceful physical education mode" what Tsinghua University and some of Academies of Fine Art praise highly to cultivate students interests and hobbies. It is not easy to generalize, whether catering or cultivating. There is a characteristic of sports interest that it must be a process one himself overcomes all kinds of difficulties, resistance, tribulations, and then become skilled in sports technology, resulting in improving athletic ability. The process of physical exercises is painful, unbearable, even may take the risk of life. It is not a process that depends entirely on sports interest.

At present, the common education mode that Academies of Fine Art carry out is "physical education curriculum options under the credit system". Concretely speaking, to catering to students' sports interest, students can choose P.E. curriculum options according to their sports interest in P.E. class. However, the students who choose the same P.E. curriculum are usually not in the same level; on the other hand, it is difficult for P.E. class according to the class model to develop a P.E. curriculum that is suitable for the students at different levels. In terms of catering to the interest, "forceful physical education mode" is better than credit system. What we must realize is that one function of education is to cultivate the students' interests. Likewise, one function of physical education is to cultivate students' sports interest by previous forceful physical education, then develops into physical habit. Catering must be based on the premise of cultivation, of which the purpose is for better catering. Catering and force should be contained with each other.

2.3 *The issue of physical exercise and the motor skills*

Physical exercise is the essence of sports. Physical education must pay attention to students' physical exercises. However, physical exercises must be based on the motor skills, and overemphasis on physical exercises and desalination movement skills of physical education make "the sheep class" into "the hawk class". Desalination technology is equivalent to let it return to the original work, which can't be seen as the progress of culture and it is bad for college sports culture inheritance.

In addition, the "system of professional" of the development of Chinese competitive sports was difficult to coordinate the contradiction between "athlete comprehensive development" and "the strategy of gold medal". In this case, it needs schools especially colleges and universities to provide a successful model of competitive sports development. As one of the main forms of "the body teach comprehensive", high level sports teams in colleges and universities should keep

pace with the development of competitive sports in China on the concept, mechanism and benefit, while "construction of school team" urgently need to be adjusted and innovated.

2.4 *The issue of "taking teachers as the leading" and "taking the student as the principal part"*

In the teaching process, some people emphasize "taking teachers as the leading" while others emphasize "taking the student as the principal part". "Dominant theory" has a long history. It goes without saying, when it comes to the knowledge and physical education; physical education teachers have the advantage status. Because they are ahead of students and superior to the students in such aspects as their age, experience, knowledge, and teaching preparation before class, as well as understanding ability about outline and teaching material and so on, they play the role of host and guide in the whole process of knowledge transferor. This kind of leading role cannot be replaced by student. The sports education theory of China, which was set up in the '50s, is basically marked out by that sports thought. For decades, we are familiar with and love in this kind of education ideas. However, this kind of education thought did not attach enough importance to lead students' active role, rarely considered the characteristic of student's body and mind and especially ignored the cultivation of student's personality. This kind of teaching is difficult to do it according to their aptitude. In this kind of teaching, information is passed mainly from teachers to students, while the interaction between students and the feedback from students to the teacher are very little. The students are in a state of a passive accept infusion, which is difficult to make them play to the initiative and enthusiasm. Some of the PE class is boring; moreover some students don't like physical education classes, whose reason mainly based on that.

However, too much emphasis of "Taking the student as the principal part" also has exposed the weaknesses in practice. What relaxed classroom atmosphere, casual relations between teachers and students, teaching material content which is lack of systematic, accommodation and catering to students interested in teaching content and methods of teaching, led to a serious decline in teaching quality, and affect the society all kinds of talents especially the high-tech talented person's raise, also bring a lot of problems on the students' morality, discipline, legal education. Physical education teaching objective conditions is poorer, which is difficult to fully satisfy every student personal requests.

It is entirely possible that we can organically combine "taking teachers as the leading" with "taking the student as the principal part". In specific process, different types of lessons (new lessons or receive lessons); grades and teaching materials need not to be consistent. The combination of education and learning becomes necessary when we regard physical education more a part of education than a kind of learning. To increase students' enthusiasm teachers are required to have higher levels of guidance. Of course, only if students take part consciously and actively can they become comprehensive and harmonious developed.

2.5 *Strengthen the education of physical education's aesthetic values*

Sport as a unique cultural form in human society has many sided values in addition to the enhancement of physique function. Aesthetic value is a more representative kind. The beauty of sports has many aspects of performance, such as physical beauty, sports beauty, form beauty, technology beauty, suspense beauty, etc. the physique teaching contains a lot of aesthetic factors, the beauty of it is comprehensive, has many side performance and characteristics. In the sports teaching practice, PE teachers combine with the professional curriculum, study knowledge of art, aesthetics and humanities broadly and in-depth, grasp the performance and characteristics of sports aesthetic values on the whole, and integrate art and aesthetic concept in the sports teaching, embody the connotation of sports aesthetic value in the whole process of sports teaching effectively, and combine the connotation with professional education. In art colleges and universities, Such as: sports athletes sculpture, ceramics, etc. Strengthening the sports esthetic education, will have a bigger role in promoting art professional education, It can active the minds of students, enhance the comprehension ability of beauty, and inspire students' creative inspiration, increase their creative works. Recommending leadership and art colleges and universities sports education workers analyze the problems in a more open field of vision and a deeper concept, discover a variety of functions and the value of the physical education, explore the higher physical education and the professional art education with the combination of law and the way actively, make sports education of art colleges and universities in promoting arts specialized education development play a more important role, and then make due contributions.

3 SEVERAL EFFECTIVE MEASURES

3.1 *Serious physical health test, and make it return to sports education evaluation*

On the main field of the 2012 national university sports science congress report, some scholars put

forward: in the implementation of "national student physique health standard" in colleges and universities, there exist some problems, working enthusiasm is not high, the pass of scoring criteria is low, the quality of mark testing instruments is not up to standard, the reliability of testing result is not high. At the same time, the physical health condition of large primary and secondary schools in China for 20 years is on the decline, the detection rates of students' overweight and obesity, poor vision, cardiovascular incidence are on the increase. Deterioration of health complications are mental health disorders, this information is spread in school in recent years. Due to the lack of physical exercise, be afraid of bear hardships, be afraid of setbacks, spoiled, often in a depressed, nervous, anxiety, fatigue, fear, caused by psychological problems of malignant cases, suicide, killing classmates; teachers and parents, the news we see an endless. In the face of the status quo, we can't do nothing, complain and wait for the arrival of the time; furthermore, we can't Pessimistic negative give up effort. There are some things we can do immediately, for example, serious physique health testing work in art colleges and universities, do your own things.

In 1979, "the middle and primary school sports work temporary regulations (trial draft)" jointly issued by the national sports commission and ministry of education, has so words: "performance evaluation physical education in primary and secondary schools, the most fundamental aspect is whether the students' physique has increased." From this point of view, physical health of students should form the basis for evaluation sports education quality in art colleges and universities.

4 TO CARRY OUT THE "SMALL SPORTS OPTION CLASS AGAIN", MEETING THE STUDENTS' SPORTS INTEREST HOBBY

Now students' interests in sports are extremely wide and varied. How to satisfy the students' sports interest or hobby as the unit of optional sports education training mode in class? Under the condition of equipment is not restricted in the stadium (hall). The teachers and students in the elective course with the time and the same project, teaching at different levels, We could break the limit of grade, break the conventional teaching in class, teach According to students' specialized skills level placement, to realize "small sports option class again" in unit time period. Thus, sports option class optimization is realized without changing the school physical teaching.

4.1 *Make students sports organization as the supplement of the sports class lack*

Now Physical classes still largely develop around the test, the standard of the baton, and ignore the rules of the development of the college students' body and mind and personality. Physical education emphasizes the biological function of enhanced physique, and look down on sports culture connotation, professional performance, and the development of the comprehensive quality. Quite a number of colleges and universities have been doing research and reform of sports teaching model, as part of the college sports in the student's sports activities. University sports club play a more and more important role. The university sports club is in conformity with the university sports reform and development direction; it has the feasibility and maneuverability; it effectively supplements the deficiency of the university sports education work, advocates the combination of the students' ability and flexibility, it does more conducive to the cultivation of students' overall quality, it also makes the students in sports club activities to establish the idea of lifetime sports, We should break the university sports education mode and idea for a long time, give strong support to the growth and development of Sports societies in colleges and universities. Put forward the following recommendations:

Strengthen the management and guidance of the sports club; make the Community cadre echelon's construction and regulations and the establishment of the management system into a virtuous circle.

Colleges and universities should increase funds input to community sports, thus make the function and role of sports club play fully.

5 OTHER ASPECTS

Headings, or heads, are organizational devices that guide the reader through your paper. There are two types: component heads and text heads.

1. Make full use of school-based resources, seek for conform to the new sports in our schools; give full play to teachers' leading role. The success of using orienteering sports curriculum of China university of geosciences is a typical example.
2. To conduct regular and irregular sports theory knowledge lecture, these are instructional lectures, which can be combined with the school track and field games, basketball games and other large sports. For instance, Track and field games referee training seminars; basketball referee training seminars, and so on.

3. PE teachers go out and take part in all kinds of preface of academic conferences boldly. Take the problem of physical education Out for help, Bring back the new idea to solve the problem.

6 CONCLUSION

Schools play macroeconomic regulation and control role in physical education teaching, sports competitions, and sports management. School dominant reform (venue, equipment, teaching staff, etc) can effectively influence directly to the school sports education of life in a short time. But in the long run, recessive reform schools (mainly embodied in the teaching idea, sports cultural festival, sports meet, clubs, sports propaganda, etc) is to accumulate over a long period to student's sports values, the development of the social adaptation ability, psychological quality and change have a profound impact. The school reforms on dominant and recessive must be objective existence, they are the two play approach to reform of school sports. However, in the actual operation process, school reform explicit and implicit influence line is not so clear, in this respect we must avoid simple and absolute. In fact they are complex to interweave together, as a whole comprehensive work. Obviously, the force of art colleges and universities physical education reform, Most art academy is only pay attention to the reform of sports dominant, there are More and more school sports venues, sports effective area is more and more big, the teachers more and more strong; However, the reform of recessive problems effect little, such as old education idea, carries out the unreasonable student option class, sports culture atmosphere is not strong and not into sports club. It is far from the pace of dominance reform, they have not formed into a pattern of going hand in hand. Art colleges and universities physical education reform is not only a need to increase the intensity of recessive reform schools, The importance of recessive reform should also be recognized clearly, we should balance the development of both to achieve dominance and contact, make sure that the physical education reform policy smoothly.

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The selection and combination of physical education teaching methods

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ABSTRACT: Through body-building teaching exploration and practice, this paper discusses the advantages of multimedia in the teaching of bodybuilding, application methods, and its new requirements for teachers. The paper aims to explore the use of multimedia in the teaching of bodybuilding, improve bodybuilding teachers' understanding of the use of multimedia teaching courseware, and, to further promote bodybuilding teaching modernization.

1 THE TEACHING METHOD IS AN IMPORTANT GUARANTEE TO REALIZE THE AIM OF PHYSICAL EDUCATION

In the process of teaching, teaching content and teaching method are inseparable. University sports teaching activities is a special form of human knowledge activities, with the deepening of the research on university sports teaching method, people realize that "in the application of teaching, teaching the wuding method, method of live". Any a kind of teaching method is not everything; it cannot be applied to the teaching process all the same. The study of teaching methods should start from the characteristics of the method itself, not only consider the object, condition, content of teaching, but also teachers feature on the teaching, choosing from various teaching methods, to form an integrated method.

Teaching goal is the foundation to determine teaching method. Should adopt different teaching methods according to different teaching goal, and changes with the change of the teaching goal. Sports teaching method is one of the most important conditions to realize the goal of sports teaching, promote the students' all-round development of body and mind. It directly affects the teaching goal. Reasonable teaching methods can stimulate students' interest in learning, arouse the initiative of student learning, cultivate the students' will, promote the development of students' good psychological quality; it is an important tool to make the students obtain the correct understanding, shorten the cognitive process, improve the efficiency of knowledge. Because of science method embodies the great value of intelligence; it is not only the means of mastering the knowledge, but also the mutual transformation between knowledge and intelligence agencies. Therefore, in teaching, scientific methods compared with specific knowledge, have greater intelligence value and mobility, it is of great significance for students to master sports skills, the school sports teaching task, realize the goal of physical education teaching.

2 THE SELECTION AND COMBINATION OF PHYSICAL EDUCATION TEACHING METHODS

2.1 *The choice of teaching methods*

2.1.1 *Choosing according to the teaching target of physical education*

Teaching aim is made of knowledge, intelligence, intention, psychological quality, thought quality, physical and other factors. In the process of its formation and development, it has both the common law, and their special laws. Therefore, besides some common methods, also need to choose different teaching methods according to different teaching goals. For example, in the distance teaching, most students feel boring. According to this characteristic, in the class, teachers can use case teaching method first, inspire student's thought through vivid case, and make the students have a further understanding of middle-long-distance project, to mobilize the enthusiasm and initiative of student learning. After middle-long-distance projects have a certain foundation, according to the level of the students, in the distance teaching with learning guide type teaching method, raising student's ability through this kind of teaching method. What modern teaching theory requires the educates, is not only what to learn, more important is learning how to learn, how to build our bodies, for life, to cultivate the students' ability of self-exercise.

2.1.2 *Choosing according to according to the reality of students*

The choice of teaching methods as well as the determination of the teaching content is influenced by students' actual level. The reality of students including knowledge, ability, thought, mental level, development level of physical and physiological factors, the level of the students independent learning these factors comprehensively shows, is the direct factors that influence the teaching method choice. For example, in serial boxing martial arts teaching, through the survey, 99% of students haven't seen this action, but they are interested in martial arts are very, very willing to learn. According to this feature, the following three steps for teaching received good teaching effect.

First step, adopt the thought in the active teaching methods. A week before in the martial arts class, the teacher announced to all students the teaching content that will learn. This process has inspired the students' interest in learning, enhanced the desire movement, eager to teachers' guidance, the enterprise motivation, students with "desire" to classes make the students entered the classroom in advance.

Second step, the teaching method of special process guiding teaching with Kay's special cognitive process, and explain the process in epistemology, arrange the three elements of the teaching process according to the special activities. At present, this method has certain universality in the process of sports teaching, under the premise of understanding teaching material, through teacher's explanation, demonstration, and other means to achieve awareness and understanding, then under the constraints of all means, master and consolidate the learning skills by practice.

Third step, use the method of group guidance. This approach are grouped according to the different of teaching material content, some according to physical, some according to sports skill to master. First we adopted the way according to technology level, students with good technical are divided into a group, and others divided into another group. On the premise of teacher unified explanation, the teachers put forward different requirements of each group and use different means, adjust group according to the personal technology progress, make students help each other, and teachers using the information feedback for guidance in the process of teaching evaluation.

2.2 *A reasonable combination of the teaching methods*

The diversity of teaching content need a variety of teaching methods to cooperate, any single method of teaching may not exist in isolation, or to work, so the teaching methods after choosing must be varied, rather than a single. So-called reasonable combination of the teaching method is to form a certain structure of the teaching methods according to the selected inner link of various teaching methods, to give full play to the comprehensive effect of the teaching method.

The rational combination of teaching method should not be a simple together of various teaching method, but a combination according to internal relations of various kinds of teaching methods, and make it as a connected whole structure, only in this way can the synthetically effects of the teaching methods into full play.

3 PROBLEMS SHOULD BE PAID ATTENTION TO THE IN THE PROCESS OF USING SPORTS TEACHING METHOD

3.1 *Should be paid attention to factors affecting the effects of physical education teaching method*

Any a kind of teaching method requires both teachers and students coordinated under certain objective conditions, to produce benefits. Having the rich professional knowledge, physical education teachers in the selection and use of sports teaching method, will be sure to obtain good results. In the sports teaching practice, the sports teachers' teaching experience, skills and characteristics and so on, has an important influence to the using effect of the sports teaching method. So, to improve the quality of the physical education teachers is the primary factor to improve the using effect of teaching method.

However, physical education teaching is a bilateral activity between teachers and students, the effect of physical education teaching methods are closely related to students' factors. Under certain conditions, is the key factor? Because the teaching effect incarnate in students, the students' subjective initiative directly affects its role in physical education teaching method, thus affecting the quality of physical education teaching. For example, when the students have less interest in class, although sports teachers explain correct, vivid image, accurate action demonstration, harmonious and beautiful, students may not "listen" and "blind", does not produce good teaching effect. Again, such as, students' with poor physical condition, do more error action, also influence the teaching effect. The students' learning motivation, initiative, enthusiasm and creativity, movement technical level and body development characteristics, interpersonal relationship, influence the teaching effect. The technical conditions and environmental factors

of sports teaching, are also cannot be ignored. For example, practicing high jump with cushions forbore style, have better effect than by bunkers, because the former can relieve students' fear psychology, improve the excitement of the nervous system. Again, such as, having class in gym, can reduce the interference of surrounding environment, help to improve teaching effect. While the using of electronic teaching means, can make up for some deficiencies of PE teachers' action demonstration, is helpful to improve the quality of physical education teaching. So, at the same time in the emphasis on the human factor, also cannot ignore the influence of material factors.

3.2 *Should pay attention to the effective cooperation of sports teaching method*

3.2.1 *Teaching and learning*

Using any kind of teaching method, should ensure that the teachers and students to coordinate the activities of both parties. Teaching is the activity that teachers and students both sides to participate in, there is no learn without teach, and there is no teach without learn. Using any kind of teaching method should not only consider the teacher's activities—how to teach, but also consider the students' activities—how to learn. In the case of one-sided emphasis on teachers as the center, the use of teaching methods, often only pay attention to how teachers teach, ignored the students how to learn. So the student do not pay attention to teacher's action demonstration, sometimes saw demonstration, but did not see the important. On the contrary, in the case of the one-sided emphasis on the students as the center, the use of physical education teaching method, often only pay attention to students how to practice, but neglected the teachers' activities. Therefore, when using any kind of teaching method, must notice the teachers and students both sides cooperate effectively, make the formation of "bilateral", through a certain teaching methods and make the teachers and students both sides of the activities to cooperate with each other.

3.2.2 *Outside and inside*

In the process of using the teaching method, teachers should not only consider the student's external activities and performance, and consider the internal activity and the change of students. Student's external activities expression in attention, mood changes, movement quality, the degree of sweating, facial expression change, etc., we can get about students' learning initiative and enthusiasm, physical condition, and study the effect of information. Student's internal activities and changes, mainly manifested in the psychological, physiological activities, such as biochemistry and bioelectricity change. These activities and changes often play an important role in learning efficiency. If these activities and change is benign, it plays a positive role in improving the quality of physical education teaching.

In general, the students' external and internal activities are consistent, but also have different condition. For example, observe the students from the outside, they staring at the physical education teachers with big eyes, the attention is "concentration", but in fact some of the students is duplicity, thinking activity did not focus on physical education, the so-called "in the clouds", "dreaming". Again, such as, students have not adapted to the exercise load, they feel the pain, but for some reason (such as bound by discipline or afraid of teacher's accused), and can't cash out. This inside and outside is different phenomena, is the factors that cannot be ignored about affecting physical education teaching quality. Therefore, the teacher in the use of physical education teaching method, must pay attention to the "double division", Combination the methods of external activities of guiding with the inspire students method of inspiring, according to the students' external activity continuously adjust the relationship between the two, so that the students lively into the physical education learning.

3.2.3 *The match of before and after*

Using a sports teaching in the sports teaching method, should pay attention to the students to master knowledge and skills at different stages of cooperation. Students' mastery and use of basic knowledge should undergo a process which is doing understand to half understand to fully understand and cannot full use to basically used to compare the use of skilled process. This is a gradual process of from the quantitative to qualitative changes. While the study and application of motor skills, experienced a series of stage, rough grasp of action, improve and improve action and consolidate with ease. In the early stages, students tend to imitate learning first, is likely to follow teachers, also can imitate others, after practice again and again, sports skill is formatted, students can completely get rid of the mode of mimicry, which can make creative starting from the characteristics of individual actions, it's gradual transition from imitation to creative and make the organic link.

Imitation is the premise and conditions of the creative, creative is the development and improve of imitation, they are the same thing at different stages of development, and they have distinction and connection. Know the different between them, which help to prevent the phenomenon of replace each other; Know that they are linked, it helps to

prevent the phenomenon of mutual fragmented. So, in the use of sports teaching method, we need to ensure their organic link before, but also to achieve distinction.

4 CONCLUSION AND SUGGESTION

4.1 *Conclusion*

Sports teaching method is varied, and mutual penetration, complement each other and interacting. Therefore, in the concrete teaching practice, only to select and combination teaching method reasonably, and use they correctly, can give full play to the role of the physical education teaching methods.

From the development of the students' cognitive and physical ability, using a variety of multi-purpose teaching method is advantage to the comprehensive development of students' cognitive ability and physical ability. Because of put numerous of teaching methods together, can make the students know their cognitive competence best, and find the most suitable method of acquiring knowledge.

From improving the quality of sport teaching, it is benefit for educates to play an advantage in their learning activities. Because use diverse teaching method, can attract the students' listening, observing, and a variety of motion perception to teaching activities, deepen the understanding of teaching material, and improve sports skills. However, diversification should also master certain advantages, so as not to distract students' attention.

4.2 *Suggestion*

For sports teachers, on the one hand, efforts should be made to learn about the theory of knowledge, grasp the teaching method that created by predecessors. On the other hand, we should practice constantly, sum up experience, form a full set of teaching method that suitable for you own characteristics. So it will be easy when choosing and using the sports teaching method, it also can enrich their sports teaching method "warehouse".

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Management and use of the stadium

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ABSTRACT: College sports facilities open to the public is the inevitable requirement of the development of modern education and the progress of civilization, to promote benign interaction between the school and the society, enhance the influence of school foreign and visibility, has important significance to improve the quality and level of running school. Good university stadium management and utilization depend largely on the management idea and the quality, characteristics of the college sports facilities and the existing problems, and puts forward some suggestions.

1 THE CHARACTERISTICS OF UNIVERSITY STADIUM AND GYMNASIUM

1.1 *From the sports facilities*

From the sports facilities, the stadium is the most complete, the quality is relatively high for the types of places, its basic function is for the school sports teaching, sports teaching, training, competition and the necessary material conditions of extracurricular sports activities and important carrier.

1.2 *From daily management point of view*

From daily management point of view, the stadium hall management appears two extreme, or is ordered to both service management, teachers and students, but also social; or poor management, repair, maintenance is not in place, resulting in a tremendous waste of resources.

1.3 *From the asset attributes*

From the asset attributes, sports venues are an important part of state-owned assets, the rational development of college sports facilities resources, bring certain economic benefits for the University at the same time, to meet the needs of social sports, can promote the development of social sports.

1.4 *From the functional perspective*

From the functional perspective, the current building mostly university gymnasium, mainly to the traditional track and field, table tennis, swimming, gymnastics, martial arts competition unit based sports venues. This can only satisfy the configuration of single mode of college sports stadiums are not up to the guidelines, and cannot satisfy the university personnel training plan near the socialization, marketization, internationalization requirements.

2 THE CURRENT PROBLEMS IN THE MANAGEMENT OF COLLEGE SPORTS VENUES

2.1 *The lack of scientific and professional management*

There are no unified management rules and regulations, no corresponding provisions of stadiums opening time, service contents and ways of management; "with" and "tube" seriously out of line, management fees, repair costs borne by the school, users have no protection, maintenance of stadiums and facilities of consciousness. Management personnel for the flow of sports system internal or rehire retired cadres, temporary workers, professional and technical personnel management deficiencies directly affect the venue management and service level.

2.2 *Open the lack of order and degree*

The exploration stage of opening to the outside world university sports venues, there is deviation of open degree of confidence. Many managers have allow someone to continue the wait-and-see attitude, closed management, it is difficult to attract social workers, makes use of the stadium's rate is greatly reduced, not only no funding sources, resulting in stadiums resources waste. In contrast, excessive commercialization, unrestrained to carry out business activities, the inevitable conflict with the school sports work and the teaching task.

2.3 *Effect evaluation index system lack of standardization*

Index system of effect compensated opening college sports venues has not been established. Unable to open the spec. Unable to open the specific measure effect, for the risk and the possible harm cannot grasp, so the potential is not compensable as soon as possible mining. In addition, paid to open, how to bear the responsibility of safety accidents, the school to protect their legitimate interests, this is the need to face the problem of. There is no uniform standards and rules, optimization will inevitably affect the open operation and the effect of.

2.4 *The lack of professional sports instructors*

With the increase of people's health consciousness, many people the entertainment at the same time also hope to get professional fitness instruction, many colleges and universities, although experts, professors have a sports industry, and no use to teach the skills, training, organization and management, strengthen the guidance of self-protection of health guidance, no use of advantage, talent resources and site resources are wasted.

2.5 *Open and occupied not complementary, harmonious development*

Domestic university stadium which is subordinated to the management department of physical education, its main function is to be responsible for the school sports teaching, training. When the stadium to expand the function of the opening to the outside world, fitness, sports industry, the management mode is difficult to deal with. The growing number of sports facilities and increasing venues usage face, very difficult to achieve "grasping, grasping teaching venue management", use, maintenance, much less sports venues and facilities are damaged problem.

3 COUNTERMEASURES AND SUGGESTIONS

3.1 *A clear functional positioning*

Adhere to the "service school, moderate opening, with venues have venues" approach, multi function realization of stadiums, both as to meet the use of school physical education teaching, and provide the training base for the school.

Positioning in the "service of teachers and students, as well as social" concept, which can meet the teaching training school sports professional use, can satisfy the need to carry out various activities of the school physical education. In addition to meet the use of school teaching and management, to do domestic and foreign major indoor sports events, large-scale cultural and sports activities; fitness, entertainment venues and facilities, equipment; utilization, explore and establish the form of fitness club management mode.

3.2 *Professional management*

The professional management of stadiums, should include the venue construction, operation, equipment, equipment maintenance, maintenance, marketing, financial management and a series of special operations. In the professional management mode, the separate management of PE teaching and sports venues, sports teaching department devoted to improving the quality of teaching, management and service sector stadiums will focus on the daily management, venue and facility management development etc. This model requires special management school venues, use and management of special responsible for the management of the school gymnasium. Capital Institute of Physical Education established independent institution venue management center at the end of 2003, a professional management Chinese school sports venues. At present, the Shenzhen University, Jiangnan University, Taiyuan University of Technology, Beijing University of Technology, Beijing Sport University, Shanghai Institute of Physical Education and other colleges and universities set up a facility management center or similar departments.

3.3 *Popular service*

Sports venue construction school basically is the public financial investment, use should adhere to the public welfare. Needs to be pointed out is, school venues and public service to meet the first school of physical education, training needs, does not impact the normal teaching order. To serve the public, to seize the key: one is the time, generally speaking, social venue school sports in spare time, such as holidays, vacations, holidays etc; two is the price, the school venues serving the society should adhere to the principle of public interest, to avoid the "service is the charge, public welfare is free" thinking, the free services and paid services combined; three is a project, should in general be open to the society, the popular of love to see and hear, health project.

3.4 *Operation market*

The price is the main lever to regulate the relationship between supply and demand in the market economy, the market in the allocation of resources

is the main lever. The stadium operators, one of the most common pricing strategy is the differential pricing, namely to different prices for the same product or service sold to different buyers. More common are time pricing, discount pricing, discount pricing of teachers and students. The development of leisure sports, the development of sports competition and performance market, the development of sports activities, sports intermediary and facility operation services, promote the coordinated development of sports and sports industry. Also pay attention to the development of intangible assets management, obtain economic benefits through the market way of advertising, corporate title of multi-level. Through the market means, the school stadium to obtain certain economic benefits for repair, stadiums, subsidies for public health, to assume their social responsibility.

3.5 *Thinking of rule of law*

Legal thinking is a form of thinking that refers to the people living under the legal system framework for legal attitude, and from a legal standpoint, people think and know the way. The stadium managers, mainly refers to the stadium in the construction, management, use and maintenance process, must establish the concept of law and the rule of law consciousness, the effective protection of supply and demand in the market operation process of both rights, urging the parties to fulfill their obligations, clearly for the two sides to be responsible for the accident, in exercise prior agreement and in conformity with the law of the solution.

3.6 *Use do during winter and summer vacation sports stadium*

The formulation of the "holiday sports program" in the holiday, make full use of the advantages of stadiums, paid operation, provide a good environment for school sports enthusiasts. The venue management gradually from the student to sports fitness membership transition, expand sports venues service area expansion, both school teachers, staff and students, or off campus sports and exercise, can according to their actual situation, to choose suitable for their exercise program and mode of motion. Through sports, to promote physical and mental health, relieve pressure, rich content of life, enjoy the fun of sports. The school holidays sports will lay the necessary foundation for perfecting the life-long sports concept, to meet the physical exercise of desire and demand, reduce idle phenomenon of sport facilities.

3.7 *Actively introduce high level sports event*

Will the school sports venues operation management and high level sports events are combined, is the operational and managerial school sports highlights, is of great practical significance, embodied in: one can improve the school's social awareness, expand the school effects in the society; two is the influence and attract students attention to sports events, in order to make students physical exercise consciously and actively, improve students' physical exercise consciousness; three is to promote the development of the school sports work; four is to serve the society, as an effective form of school social returns.

"The school should be in accordance with the Ministry of Education issued the 'ordinary higher school sports facilities, equipment directory' and the relevant provisions of the planning and construction, to create the conditions to meet the actual needs of the sports curriculum, take measures to extend the period of stadiums, facilities, improve the utilization rate of the sports facilities". To provide a theoretical basis for this text for the school sports facilities to open the. As much as possible to reduce the idle phenomenon of school sports facilities, rational development and utilization, scientific management and utilization of this valuable resource, so as to meet the teaching training school sports professional use, can serve the society, service people, realize the use and maintenance of both venues, curriculum and training synchronization, games and paid opening promote each other the ideal state.

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