UNIVERSITY CURRICULUM UPDATE ON AEROBIC PHYSICAL EDUCATION

ATUALIZAÇÃO DO CURRÍCULO UNIVERSITÁRIO EM EDUCAÇÃO FÍSICA AERÓBICA

ACTUALIZACIÓN DEL PLAN DE ESTUDIOS UNIVERSITARIO DE EDUCACIÓN FÍSICA AERÓBICA

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ABSTRACT

Introduction: Although colleges and universities have improved their aerobic physical education systems, the teaching design has a partially scientific basis, requiring urgent updating. Objective: Research means of scientific improvement to the aerobic physical education curriculum in colleges and universities. Methods: A total of 594 students and 52 teacher questionnaires were collected to understand the background of the research. Four groups of athletes were selected for relevant data collection. A kinematic analysis with a reflective ball at different joints and limbs archived the main variables of the most demanded actions on a force measurement platform, which were combined with the athletes' data. Results: Through the integration and analysis of the research results, this paper obtained a scientifically based training scheme with clear training objectives. It also displays a deeper understanding of the actual situation of teaching aerobic physical education in colleges and universities. Conclusion: This paper designs a scientifically-based aerobics optimization scheme according to the characteristics of colleges and universities, addressing the real needs of students and promoting the improvement of aerobic physical education teaching in colleges and universities. ***Level of evidence II; Therapeutic studies - investigation of treatment outcomes.***

Keywords: Biomechanic; Gymnastics; Physical Education and Training; Universities.

RESUMO

Introdução: Embora as faculdades e universidades tenham aprimorado seus sistemas de educação física aeróbica, o projeto do ensino não dispõe de um embasamento científico completo, necessitando de uma urgente atualização. Objetivo: Pesquisar meios de aprimoramento científico ao currículo de educação física aeróbica em faculdades e universidades. Métodos: Um total de 594 questionários de estudantes e 52 questionários de professores foram coletados para compreender o histórico da pesquisa. Quatro grupos de atletas foram selecionados para a coleta de dados relevantes. Uma análise cinemática com bola refletiva em diferentes articulações e membros, arquivou as principais variáveis das ações mais demandadas numa plataforma de medição de força, que foram combinados aos dados dos atletas. Resultados: Através da integração e análise dos resultados da pesquisa, este trabalho obteve um esquema de treinamento com embasamento científico e objetivos claros de treinamento. Também exibe um entendimento mais profundo da situação real do ensino de educação física aeróbica nas faculdades e universidades. Conclusão: Este documento projeta um esquema de otimização de aeróbica com embasamento científico de acordo com as características das faculdades e universidades, abordando as necessidades reais dos estudantes, promovendo a melhoria do ensino no curso de educação física aeróbica das faculdades e universidades. ***Nível de evidência II; Estudos terapêuticos - investigação dos resultados do tratamento.***

Descritores: *Biomecânica; Ginástica; Educação Física e Treinamento; Universidades.*

RESUMEN

Introducción: Aunque los colegios y universidades han mejorado sus sistemas de educación física aeróbica, el proyecto de enseñanza no tiene una base científica completa, lo que requiere una actualización urgente. Objetivo: Investigar los medios para mejorar científicamente el plan de estudios de educación física aeróbica en los colegios y universidades. Métodos: Se recogieron un total de 594 cuestionarios de alumnos y 52 de profesores para conocer los antecedentes de la investigación. Se seleccionaron cuatro grupos de atletas para recoger los datos pertinentes. Un análisis cinemático con un balón reflectante en diferentes articulaciones y extremidades, archivó las principales variables de las acciones más demandadas en una plataforma de medición de fuerza, que se combinaron con los datos de los atletas. Resultados: A través de la integración y el análisis de los resultados de la investigación, este trabajo obtuvo un esquema de formación con base científica y objetivos de formación claros. También muestra un conocimiento más profundo de la situación real de la enseñanza de la educación física aeróbica en los colegios y universidades. Conclusión: Este trabajo diseña un esquema de optimización del aeróbic con base científica según las características de los colegios y universidades, atendiendo a las necesidades reales de los estudiantes, promoviendo la mejora de la enseñanza en el curso de educación física aeróbica en los colegios y universidades. ***Nivel de evidencia II; Estudios terapéuticos - investigación de los resultados del tratamiento.***

Descriptores: *Biomecánica; Gimnasia; Educación y Entrenamiento Físico; Universidades.*

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INTRODUCTION

With the promotion and popularization of national fitness, while people's basic material life is satisfied, they gradually begin to pursue the high-quality development of life. Their physical health has been highly valued in individual cognition. People actively participate in all kinds of sports.[1] Aerobics has played a very positive role in the physical health index of student groups. Aerobics combines gymnastics, dance and music as one of the diversified sports. And aerobics plays a vital role in improving the physical coordination, flexibility, endurance and beauty of students.[2] Aerobics items have no special requirements for sports equipment, and activities can be carried out with or without equipment. Aerobics has no special requirements for the choice of venues, and sports can be carried out in almost all places. Aerobics is mainly aerobic exercise, which plays a more obvious role in improving the health of Obese College Students and students with low immunity.[3] People of different ages can participate in relevant activities of Aerobics projects. For students with different foundation and sports ability, aerobics projects have different types of projects. Collective aerobics is more popular in the project and cultivate students' team consciousness. Although the threshold of aerobics is very low and the risk is small, it still needs to pay attention to self-protection during exercise.[4] Colleges and universities can carry out aerobics courses for college students, increase the types of aerobics, and promote college students to become an important group of Aerobics lovers. Aerobics Athletes in professional sports colleges should innovate and study more advanced aerobics types, technical movements and sports ideas in basic courses. Carry out aerobics activities among colleges and universities, strengthen cooperation and share sports experience.[5] However, the current aerobics physical education curriculum has the problems that the teaching form is superficial, the content is too simple or the teaching difficulty is too high, which makes the students unable to grasp. This paper arranges and analyzes the joint movement characteristics of high-level Aerobics athletes, so as to provide a more scientific scheme for the optimization of aerobics courses in Colleges and universities.

METHOD

In order to know more about the actual situation of the current aerobics teaching, this paper chose the way of questionnaire survey, distributed and recovered the data through the network platform, and made statistics on several colleges and universities in the research area. The study and all the participants were reviewed and approved by Ethics Committee of Guangxi University of Science and Technology (NO.2019GXUST36). A total of 598 student questionnaires were obtained, and 4 invalid questionnaires were excluded, a total of 594. There were 54 teacher questionnaires, excluding two invalid questionnaires, a total of 52. Thus, we have more understanding of the basis for the current evaluation of the teaching effect of college entrance aerobics and the optimization of college entrance aerobics courses.

In this paper, four groups of athletes are selected to collect relevant data under the condition of complete voluntariness. These four groups of athletes are grouped into four types: double foot right turn take-off, left foot right turn take-off, double foot left turn take-off and left foot left turn take-off, so as to have a better understanding of different sports methods. In the process of sports, athletes maintain a good sports state, sort out the obtained data, remove the data with large error, and take its average value as the data result of this sports type.

Through systematic collection and input, the questionnaire results of students and teachers and the data collection results of different groups of athletes are sorted and summarized respectively. The data are sorted and analyzed by using Excel software, and relevant pictures are drawn to make the research effect clearer.

RESULTS

Analysis of joint movement characteristics in different stages of Aerobics

Where: ln represents the angle of left knee; RN represents the angle of the right knee; La represents the left ankle angle; RA represents the right ankle angle; GVU is the vertical velocity of the center of gravity.

As shown in Table 1, when the athlete takes off by turning both feet right, the left knee angle is 165.5146 °, the right knee angle is 173.4631 °, the left ankle angle is 142.0652 °, the right ankle angle is 149.5853 °, and the vertical speed of the center of gravity is 1.8476m/s; When the athlete takes off by turning the left foot to the right, the angle of the left knee is 156.1249 °, the angle of the right knee is 136.3325 °, the angle of the left ankle is 112.9904 °, the angle of the right ankle is 113.0352 °, and the vertical speed of the center of gravity is 1.6379 M / S; When the athlete takes off with both feet turning left, the left knee angle is 172.8195 °, the right knee angle is 167.8152 °, the left ankle angle is 155.4776 °, the right ankle angle is 170.9992 °, and the vertical speed of the center of gravity is 1.9998 M / S; When the athlete takes off with the left foot turning left, the left knee angle is 172.8850 °, the right knee angle is 152.2932 °, the left ankle angle is 143.4233 °, the right ankle angle is 109.5290 °, and the vertical speed of the center of gravity is 2.1695 M / s. It can be seen from this that the data results of joint motion by different take-off modes are also different.

As shown in Table 2, when the athlete takes off to the air stage by turning both feet right, the separation angle of the two legs is 150.9532 °, the angle between the trunk and the left leg is 21.7539 °, the angle between the trunk and the right leg is 24.9398 °, and the height of the center of gravity is 1.2381m; When the athlete takes off to the air stage by turning the left foot to the right, the separation angle of the two legs is 152.3033 °, the angle between the trunk and the left leg is 29.7092 °, the angle between the trunk and the right leg is -39.0826 °, and the height of the center of gravity is 1.1092m; When the athlete takes off to the air stage by turning both feet left, the separation angle of the two legs is 135.3687 °, the angle between the trunk and the left leg is -52.4977 °, the angle between the trunk and the right leg is -29.9151 °, and the height of the center of gravity is 1.3879m; When the athlete takes off to the air stage with the left turn of the left foot, the separation angle of the two legs is 164.9813 °, the angle between the trunk and the left leg is 19.7204 °, the angle between the trunk and the right leg is -17.2576 °, and the height of the center of gravity is 1.5925 M. This shows that even when athletes show a small and small separation angle of their feet in

Table 1. Characteristics of joint movement in take-off stage.

Jumping method	LN(°)	RN(°)	LA(°)	RA(°)	GVU (m/s)
Both feet (right turn)	165.5146	173.4631	142.0652	149.5853	1.8476
Left foot (right turn)	156.1249	136.3325	112.9904	113.0352	1.6379
Both feet (left turn)	172.8195	167.8152	155.4776	170.9992	1.9998
Left foot (left turn)	172.8850	152.2932	143.4233	109.5290	2.1695

Table 2. Characteristics of joint motion in air phase.

Jumping method	Leg separation angle (°)	Angle between torso and left leg (°)	Angle between torso and right leg (°)	Height of center of gravity (m)
Both feet (right turn)	150.9532	21.7539	24.9398	1.2381
Left foot (right turn)	152.3033	29.7092	-39.0826	1.1092
Both feet (left turn)	135.3687	-52.4977	-29.9151	1.3879
Left foot (left turn)	164.9813	19.7204	-17.2576	1.5925

the air, there are certain differences in the angle of trunk and leg and the height of center of gravity due to different take-off methods.

As shown in Table 3, when the leg swings to the highest point, the hip swing angle of the athlete taking off by turning both feet right is 81.7347 °, the hip support angle is 173.4916 °, the knee swing angle is 49.7603 °, and the knee support angle is 173.8290 °; When the athlete takes off with the left foot turning right, the hip swing angle is 48.1735 °, the hip support angle is 171.2668 °, the knee swing angle is 46.3743 °, and the knee support angle is 161.2923 °; When the athlete takes off with both feet turning left, the hip swing angle is 56.3584 °, the hip support angle is 163.8146 °, the knee swing angle is 42.9957 °, and the knee support angle is 173.6785 °; When the athlete takes off with the left foot turning left, the hip swing angle is 75.2048°, the hip support angle is 171.3707 °, the knee swing angle is 50.3395 °, and the knee support angle is 152.2155 °. (Table 4)

It can be seen from the comprehensive analysis that some sports characteristics of athletes in different stages are the same, but there will also be some differences in the sports characteristics of some joints due to the differences of athletes' own conditions and their take-off methods. The choice of take-off mode or sports training scheme is also designed by coaches based on the comprehensive basis of athletes' own physical quality and psychological needs. This is projected into the aerobics teaching curriculum, which is reflected in the scientific design of sports training scheme according to students' own characteristics and needs, so as to enable students to obtain more scientific education.

Analysis on the current situation and optimization basis of Aerobics Teaching in Colleges and Universities

Figure 1 shows the aerobics teaching evaluation conducted by college students. Among the 594 students, 189 thought the teaching content was simple, and the total proportion was 31.818%; The number of students who think the teaching content is complex is 177, and the total proportion is 29.798%; The number of students who failed to distinguish between different student levels was 439, and the total proportion was 73.906%; The number of students who think that the action correction is not in place is 398, and the total proportion is 67.003%.

According to the investigation on Aerobics Teaching Optimization of relevant teachers in Colleges and universities in Figure 2, 34 of the 52 teachers believe that they can be based on the existing teaching resources, accounting for 65.38% of the total; The number of teachers that can be based on their own expertise is 51, accounting for 98.08%

Table 3. Characteristics of joint movement when the leg swings to the highest point.

Jumping method	Hip swing (°)	Hip branch (°)	Knee swing (°)	Knee support (°)
Both feet (right turn)	81.7347	173.4916	49.7603	173.8290
Left foot (right turn)	48.1735	171.2668	46.3743	161.2923
Both feet (left turn)	56.3584	163.8146	42.9957	173.6785
Left foot (left turn)	75.2048	171.3707	50.3395	152.2155

Table 4. Characteristics of joint motion in landing buffer stage.

Jumping method		Hip joint (°)	Knee joint (°)	Ankle joint (°)
Both feet (right turn)	Left side	-38.1920	24.4296	47.3351
	Right	-59.7595	-15.2794	49.7447
Left foot (right turn)	Left side	11.4271	24.6187	31.1442
	Right	17.7943	23.4758	32.3685
Both feet (right turn)	Left side	-2.3626	34.2552	56.7136
	Right	7.8842	36.7050	33.8607
Left foot (right turn)	Left side	24.5570	51.7461	43.1574
	Right	35.9575	45.8887	64.8201

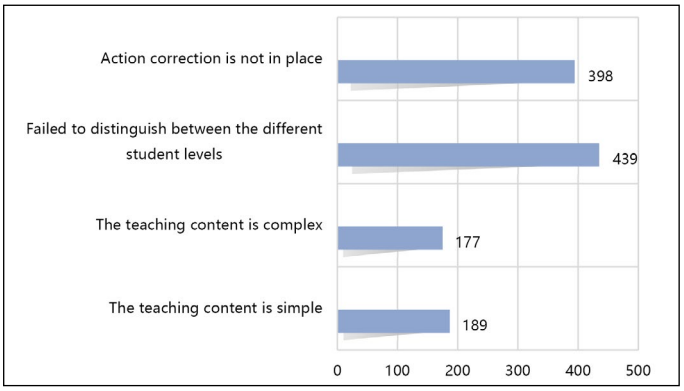

Figure 1. Evaluation of aerobics teaching in Colleges and Universities.

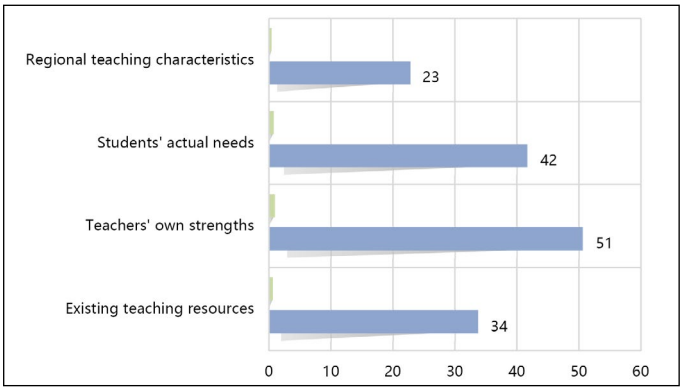

Figure 2. The basis of optimizing aerobics teaching curriculum in Colleges and Universities.

of the total; The number of teachers who can meet the actual needs of students is 42, accounting for 80.77% of the total; The number of teachers that can be based on regional teaching characteristics is 23, accounting for 44.23% of the total. It can be seen that the current curriculum optimization of Aerobics in Colleges and universities also needs to be optimized according to the actual needs of students on the basis of teachers' own strengths and existing teaching resources, and also take into account the regional teaching characteristics.

DISCUSSION

Use standard teaching materials with formal and scientific basis as guidance to cultivate a professional team of aerobics training teachers. The teaching mode of combining theory with practice. According to different weather and seasons, different curriculum arrangements should be customized. Qualified colleges and universities should formulate targeted training plans for different personnel. Professional sports colleges and universities can summarize and innovate in practice in the direction of cultivating professional aerobics talents, enrich and improve aerobics technical actions and theoretical knowledge, so as to improve the overall level of Aerobics among college students. The education department should update the advanced course materials in real time and improve the teaching mode by using modern science and technology. Use a variety of channels to arrange teaching courses, and create a far-reaching teaching model to adapt to the times on the basis of the traditional teaching model. To improve the participation of college students, we should popularize aerobics knowledge and spread the advantages of Aerobics projects. In the practical course, we should standardize the guiding technical essentials to avoid sports injury to college students. Pay attention to physical strength training and carry out difficult technical training on the basis of good body. Guide college students to participate in sports and improve their health. Strengthen cooperation among high-efficiency students, jointly establish relevant

courses and activities, and strengthen communication, which is beneficial to the positive development of Aerobics among college students.

Colleges and universities should transform, improve or build professional sports venues and supporting sports facilities according to their own economic conditions, and practice gymnastics teaching should be carried out in professional venues as far as possible.

CONCLUSION

Through the research results of this paper, it can be seen that although the current Aerobics Teaching in Colleges and universities has been carried out, there are still many problems, so it needs to be adjusted purposefully. Through the analysis of the sports mechanics characteristic points of different joints in the process of aerobics teaching, the author has obtained some data basis for the scientization of aerobics teaching, which is combined with the current teaching situation, this paper puts forward its own opinions on the optimization of Aerobics physical education curriculum, so as to promote the further development of Aerobics Teaching in schools.

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