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The feature analysis of the step aerobics competition routine arrangement of the 26th FISU

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ABSTRACT

According to the music, the skills on or under the step of the top six teams in the Step Aerobics' finals of the 26th FISU and the related match rules, this thesis will make a statistics analysis which tends to summarize the music, the situation and the regular patterns of the techniques used in the Step Aerobics. Therefore, it will be helpful to find the features and the development direction of the arrangement in the Step Aerobics. What's more, to provide valuable reference for the grass-roots coaches, this in turn can largely promote the popularity and development of the Step Aerobics.

Key words: the FISU, aerobic step, competition routine, arrangement characteristic

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INTRODUCTION

Step Aerobics derived from America in 1968 and soon became famous all over the world. Belonging to one kind of light equipment aerobics, it refers to that with the accompaniment of music, it can combine the steps exercise in the physical tests with the basic steps of aerobics, centering on special equipment-step, to carry on the body building activities such as going up, coming down or crossing the step. Step Aerobics consists of two parts, Fit Step and Aerobic Step. Fit Step, composing of comparatively simple steps and derivative steps, mainly apply to the common people. At the moment, no matter what they are called, the Step Aerobics courses opened both in gymnasiums and schools of our country mainly refer to this kind. Aerobic Step develops from Fit Step, with a competitive tone, it often can be seen in aerobics events. Basing on a series of novel routines from certain match rules, it requires the trained athletes, within one minute and thirty seconds (plus or minus five), to fully embody the characteristics of height, novelty, complexity and beauty with the steps in a square of 10 meters×10 meters. The 26th FISU in 2011 for the first time list the aerobics in the formal competition events. In order to stress the features of aerobic, further promote aerobics' development and attract more people to take part, the FIG first carry on the revolution of aerobic, and the newly fixed items include mixed pair, trio, group (5-6 people), aerobic dance (5-10 people), aerobics step (5-10 people) and team event. In the meanwhile, the 2013-2016 period aerobics rules revised by the FIG firstly list the Aerobic Step in the Aerobic Gymnastics World Championship [1]. This is the only match event which requires equipment and the only one which needs no degree of difficulty among the seven items of the World Championship, and the low demand of intensity and physical fitness can better suit the majority, which will add more charm to the innovative development of aerobics.

This thesis try to make an analysis about the routine arrangements in the Step Aerobics' finals of the 26th FISU, with reference of related match rules and various statistics, concluding the regular patterns, features and development direction of the routines in Aerobic Step. In this way, it can provide valuable reference for the grass-roots coaches as well as promote the development of the Step Aerobics both in theory and in practice [2].

EXPERIMENTAL SECTION

2.1. Object of study

The thesis takes the arrangement of the Aerobic Step as the object of study and takes the top six teams' routines in the Step Aerobics' finals of the 26th FISU as the object of observation.

2.2. Research methods

2.2.1. The literature material law

It refers to make a comprehensive analysis after using literature search, looking up related thesis and material about aerobics, Step Aerobics of recent years.

2.2.2. The video observation law

Taking the top six teams' routines in the Step Aerobics' finals of the 26th FISU as the object of observation, consulting "The Scoring Guide of National Aerobics Competition in 2012" and combing the lectures of the National Aerobics Competition in 2012 as well as the refees' training class of National Aerobics Show, which were given by a famous Chinese coach Jianjun Bu, then finally define the observing indexes of this research. Furthermore, make an analysis about the inscape of the speed of music and the skills on or under the step.

2.2.3. Quantitative data statistics

Using excel statistical data software to make some calculation such as frequency, summation and average.

RESULTS AND ANALYSIS

3.1. The comparison and analysis of the speed of music employed by all teams in their routine arrangement

To some extent, the speed of music can directly control the amount of exercise and suitable speed becomes one matter to which one should pay much attention during the arrangement. In this match, it requires that the movement of Aerobic Step should be finished within one minute and thirty seconds (plus or minus five). From the table 1, we can see that: Taking account of time, except Mongolian team use time less than one minute and thirty seconds, the others all use time longer than that; about the number of beats, the majority of team make up 28 to 29 eight beats, while Ukrainian team only make up 27 eight beats, with which the athletes show less information within the limited time. On the contrary, Mongolian team make up 31 eight beats, revealing the most information to some extent. On the speed of music, Chinese team and Russian team control the music at the speed of 148BPM, Korean team 148.7BPM, Italian team 146.7BPM, Ukrainian team 142.2BPM, and Mongolian team 169.8BPM. Comparing the speed of music with the final rank of match, people can find that the teams which employ the music either too fast or too slow have to fall behind, for if the music is too slow, it cannot fully show the ability of individual or team, therefore, cannot embody he dynamism or activity; if the music is too fast, it will make athletes lack adequate time, which will largely effect the quality of movements. For this reason, the speed of music should be controlled within a reasonable extent and in the meanwhile taking athletes' ability into consideration [3]. To conclude, the speed of 150BPM can both perform the function of rising sensations as well as stimulating expressive force of music and make the athlete display his proficiency on the premise of finishing the task perfectly.

Table 1: The Comparison and Analysis of the Time, Number of Beats and the Speed of Music Employed by all Teams in Their Routine Arrangement

Team	China	Russia	Korea	Italia	Ukraine	Mongolia
Ranking	1	2	3	4	5	6
Time (minutes' seconds '')	1′ 32″	1′ 32″	1′ 34″	1′ 32″	1′ 32″	1′ 28″
Total number of Beat	28×8+3	28×8+3	29×8+1	28×8+1	27×8+2	31×8+1
Music speed (BPM)	148	148	148.7	146.7	142.2	169.8

3.2. The comparison and analysis of the skills on step in entire exercise

The entire exercise of Aerobic Step demands using basic steps to show athletes' ability of finishing movements with the step and reflecting the variety of rhythm, transformation as well as complicated skills on or under step. The skills on the step mainly include transverse crossing, vertical crossing, diagonal crossing, twist on step and other forms which can reveal athletes' ability [4].

The step is the most basic section of Step Aerobics, actually, it is the ninth member of the team (supposing the team has eight people), in other words, it is an essential part of the whole thus staying or moving on it becomes quite important. From table 2, we can know that Chinese team and Korean team adopt frequently the skill of vertical crossing, while other teams pay more attention to transverse crossing. Except Chinese team and Italian team, the other four teams all use diagonal crossing, and the skill of twisting on step employed comparatively less. Comparing

and analyzing the data, it can conclude that the teams all prefer the skills of transverse crossing on step and vertical crossing under it to its reverse. Moreover, apart from the six crossing forms mentioned, each team also add various comprehensively crossing according to athletes' number and characteristics, such as combing transverse crossing with diagonal crossing, merging vertical crossing into diagonal crossing and other distinguishing features of their own.

Table 2: The Comparison and Analysis of the Skills on Step in Entire Exercise

Team	Transverse crossing	Vertical crossing	Diagonal crossing	Twist on step	Cross on and vertical under	Vertical on and Cross under	Complex
China	11	22	0	0	1	0	10
Russia	15	5	4	2	4	0	14
Korea	7	12	1	0	6	0	20
Italia	18	7	0	1	2	2	16
Ukraine	16	14	1	0	6	6	5
Mongolia	20	15	2	1	2	2	9
Total	87	75	8	4	21	12	74

3.3. The comparison and analysis of the skills under step in entire exercise

The skills under step refer to reflecting the form of team sports through the actions and relations among the athletes, including formation change, cross flow, step change technique, dynamic interaction and lift [5]. The skills under step is one of the important parts of entire exercise, therefore, people should have an all-round consideration about its arrangement and make the entire exercise more perfect.

3.3.1. Formation change and cross flow

Formation Change can be divided into three kinds: ①Movement of both people and steps; ②Movement of partial people and steps; ③Movement of neither people nor steps. The commonly used is the movement of both people and steps and the movement of only people. From the view of cross flow, the movement of only people often employed among team members and cannot be classified into formation change. However, the real formation change refers to the movement of both people and steps as well as the movement of partial people and steps.

The rules require that there must be at least 5 times evident formation change in entire exercise. From table 3, we can see that each team uses 5 or more than 5 times transformations. And the perfect form is the combination of step and athlete, which means the athlete perform elegantly and skillfully with the step, no matter holding or placing it. It seems that the athletes are playing the steps, which has already become their partners rather than simple tools or burdensome. On the premise of obeying the rules, each team also arranges other transformations, among them, the frequently used one is the movement of only people, 12.5 times on average, as it can make the picture flow and enhance visual enjoyment through changing team members' positions. What' more, one of its bigger advantages is that it can be achieved fast, conveniently without too many beats. The movement of partial people and steps is also an important transformation, which can be seen frequently in the performance of Chinese team, while other teams only use one time at most [6]. From the final rank of match, it is evident that one should pay more attention to the movement of partial people and steps during the routine arrangement of Step Aerobics.

Table 3: Statistics on the Frequency of Formation Change in Entire Exercise

Team	Ranking	Movement of both people and steps	Movement of partial people and steps	Movement of only people
China	1	7	4	13
Russia	2	7	1	13
Korea	3	5	1	14
Italia	4	7	0	11
Ukraine	5	5	1	15
Mongolia	6	7	0	9
Average	-	6.3	1.1	12.5

3.3.2. The application of step change technique

It is absolutely necessary to use steps to achieve any formation in the match of Step Aerobics and each team has his own innovation and understanding about it. In this match, we can see different forms, such as hugging the step laying or standing, holding it over head, holding it by one hand or two, holding it when twisting and even tossing and catching the step. From table 4, people can see that all teams employ the method of hugging step by two hands, and except the basic forms, the top three teams also adopt more various step changing technique, especially Korean team and Chinese team, which employ 5 and 4 kinds of techniques respectively. The top three teams all choose the form of hugging step when twisting. Besides, Chinese team and Korean team also adopt the form of holding step over head. While the other three teams only use the form of holding step by two hands, which seems a little unitary.

In a word, diversified step change techniques can not only increase the interesting and esthetics of movements, but also perfect the features of Step Aerobics.

Table 4: Statistics on the Step Change Technique in Entire Exercise

Team	The form of holding step
China	hugging the step laying, hugging the step standing, holding it over head, twisting
Russia	hugging the step laying, twisting
Korea	hugging the step laying, hugging the step standing, holding it over head, twisting, circling
Italia	hugging the step laying
Ukraine	hugging the step laying
Mongolia	hugging the step laying

3.3.3. Dynamic interaction

Dynamic interaction refers to a kind of mutual relation produced by two or more members when making the movements on the ground individually. From the table 5, one can see that each team adopts more than one time of dynamic interaction during the arrangement. Chinese team breaks the conventional routines of interaction between two people and adopts six people's interaction, which adds new spotlight for its performance. Although Korean team consists of six female athletes, it employs different forms such as 2 people group or 3 people group to reveal the variety. Russian team and Italian team arrange 4 to 5 times interaction according to sex difference, but they only have this one form. Ukrainian team and Mongolian team use 3 times of two people's interaction, which is common and simple. No matter which form adopted, the aim is to show the mutual relation among the team members. Therefore, novel and various dynamic interactions play an important role in the routine arrangement of Aerobic Step [7].

Table 5: Statistics on the Dynamic Interaction in Entire Exercise

Team	China	Russia	Korea	Italia	Ukraine	Mongolia
Ranking of art	1	1	3	4	5	6
Number of occurrences	1	2	5	4	3	3
Type (person)	6	3;2	2	2	2	2
Type Species	1	2	1	1	1	1

3.3.4. The application of lift

Lift refers to a course during which one or more people form the foundation for listing or hugging the other athletes in the air, and at the same time change various poses at different heights in a three-dimensional space, revealing athletes' strength, flexibility as well as mutual privities to the full. Lift is an essential section of Step Aerobics, which can show the special change of movements and improve greatly the esthetics of the whole routine [8]. From table 6, people can see that all teams choose one time list according to the rules, however, the time and type of lift are colorful and unique: (1) The moment of list: Chinese team and Ukrainian team choose the lift at the beginning. They make the pose in advance and finish it after hearing the warning tone. Russian team and Mongolian team choose the lift in the middle; while Korean team and Italian team finish their performance by lift, which can successfully embody the sense of layer of the ending. (2) The duration of lift: Ukrainian team uses the shortest time, which consists of 6 beats and very simple. Chinese team and Italian team use 1×8 beats; Russian and Mongolian teams use 2×8 beats; while Corean team uses 2×8＋4 beats, which is the longest among them. (3) The number of people of lift: All the athletes of Korean team , Italian team, Ukrainian team and Mongolian team take part in the lift. Six athletes of Russian team participate with others making the decoration, shaping a comparatively isolated performance. In Chinese team, only three members participate, and the other six members cooperate the three to reveal the various special change at different time, position and place, echoing them when the point get the highest, in this way produce a complete and harmonious picture and reflect the handiness as well as originality of the arrangement. Italian team and Ukrainian team make two groups to lift two points, and the other four teams choose to lift one point. (4) About the number of people who make the foundation, Chinese team and Ukrainian team change the number once, and Korean team change four times to reveal its complication and diversity. (5) Although promised, all teams finish the lift without steps, which to some extent fail to stress the feature of Aerobic Step amplify.

Table 6: Statistics on the Distribution, Type, Time and Frequency of Lift in Entire Exercise

Team	China	Russia	Korea	Italia	Ukraine	Mongolia
Time distribution	The beginning	The middle	The end	The end	The beginning	The middle
Share eight-beat	1×8	2×8	2×8+4	1×8	1×6	2×8
Participate directly	3/9	6/10	6/6	8/8	8/8	6/6
Base number	2	4-5	4-3-4-3	3-1	3	4-3
The aces/group number	1/1	1/1	1/1	2/2	2/2	1/1
Pedal application	None	None	None	None	None	None

3.3.5. The arrangement of spatial switching

It should reflect the employment of three plans in entire exercise, which is difficulty but an important aspect to show the artistry of movements. The rules of Sports Aerobics divide the space into three layers, ground A, stand B and soar C, this thesis will also follow the suit. From table 7, people can know that the main kinds of spatial switching are B-A, B-C-B, then the B-A-B, A-B and B-C. Chinese team and Korean team use the type of B-A most, Russian team and Ukrainian team use B-C-B frequently, and Mongolian team thinks B-A-B the best. Korean team uses the most kind, eight kind in all, then Italian team, and Ukrainian and Mongolian teams which rank behind use it the least.

Table 7: Statistics on the Arrangement of Spatial Switching in Entire Exercise

Type	China	Russia	Korea	Italia	Ukraine	Mongolia	Total
A-B	2	0	2	1	0	0	5
B-A	3	1	5	1	1	1	12
B-A-B	0	0	1	1	1	3	6
B-A-C	0	0	1	0	0	0	1
B-C	1	1	1	1	0	0	4
B-C-B	2	4	1	1	2	0	10
B-C-A	0	0	1	1	0	1	3
C-B	1	1	0	0	0	0	2
C-B-A	0	0	1	0	0	0	1
Total	9	7	13	6	4	5	-
The appears number	5	4	8	6	3	3	-

3.3.6. Different levels of arrangement

The difference can be seen in many aspects: (1) Different movements at the same time; (2) Same movement finished at different time or finished symmetrically at the same time.

Different movements at the same time refers to athletes finish different actions in the same beat, which will give more visual information in each beat and produce stronger impact [9]. From table 8, we can know that the top three countries pay more attention to this kind of arrangement, especially Chinese team, in which the proportion of this kind takes 35.8% among all beats.

Table 8: Statistics on the Different Movements at the Same Time in Entire Exercise

Team	China	Russia	Korea	Italia	Ukraine	Mongolia
Different actions	10×8	9×8	7×8	1×8	5×8	1×8
Percent (%)	35.8	32.1	24.2	3.6	18.2	3.3

From watching the video people can conclude the following: (1) In order to make teams ordered and united, all teams choose the same movements at the same time. (2) Chinese team let different athletes finish different movements in the same beat, that is to say, finishing the movements in turns, which will give more visual information in each beat and produce larger impact. (3) Italian team finishes the movements symmetrically at the same time. From the video people can see that Italian male athletes wear black uniforms and female athletes wear black-and-white uniforms. So when they are acting the symmetrical actions, they give a black-and-white picture to the audience who can feel a stronger visual stimulation [10].

CONCLUSION

(1) The speed of music of Aerobic Step should control within a reasonable extent according to athletes' ability, suggesting at 150 BPM around.

(2) In the arrangement of skills on step, coaches should not only pay attention to basic forms such as transverse crossing and vertical crossing, but also attach more importance to compressive crossing technique as well as diagonal crossing and twist on step.

(3) Formation change and cross flow are two important parts of skills under step, except the required movement of both people and steps, coaches should think highly of the movement of only people and add the movement of partial people and steps properly to vary the formation.

(4) In the arrangement of step change technique, apart from the most basic forms such as hugging the step when lying or standing, athletes can adopt twisting step, circling and other methods to increase the interesting and esthetics of performance, showing the feature of Step Aerobics.

(5) The arrangement of dynamic interaction and lift should reveal the skills and creativity. According to the different physiological characters and forms of expression of male and female athletes, coaches can make up novel and various interaction and lift with the full use of step, making the movements smoothly and naturally.

(6) The high utilization rate of space and the fast speed of transformation can largely increase the artistic value of movement. During the arrangement, coaches should create the type of spatial change and use the space to the full according to the match rules as well as athletes' ability.

(7) Besides adopting ordered and consistent routines, coaches can also choose the form of finishing movements in turn or finishing symmetrically. In this way can not only enrich the material, but also send more information, giving audience a stronger visual impact.

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