

METHODS FOR TEACHING DIFFICULTY ELEMENTS IN AEROBICS GYMNASTICS

(Preliminary communication)

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Abstracts

For creation of stable base of our methods, we examined basic prerequisites for motor movements' education. They are physiological mechanisms for building up motor habits, motor apparatus as well as the anatomical and functional peculiarities, biomechanical characteristics of movements, pedagogical prerequisites and the difficulty elements' performance by optimum technique. The main points of the methods structure are: classification of the elements, determination of phase structure, motor qualities needed, motor base needed, algorithmic chains for teaching difficulty elements, special methodological guidelines for teaching elements, technique building exercises, conditioning. The results of the 2 years pedagogical experiment proved the practical workability of our methods for teaching difficulty elements in aerobics gymnastics. A great number of elements have been assimilated during our 2 years experiment. The examined methods for teaching difficulty elements in aerobics gymnastics was found to be very successful due to its ground and contents. Our opinion is that the methods can be used in other sports for training specific technical skills or motor movements.

Keywords:

aerobics gymnastics, motor movements, motor qualities, pedagogical prerequisites, motor habit teaching process mechanisms building, training methods, pedagogical prerequisites, algorithmic chain for teaching difficulty elements, pedagogical experiment

INTRODUCTION

The rapid development of sports aerobics during the last few years has put to trial not only the competitors, but the coaches as well in their efforts to successfully control the process of education and training. The achievement of top results is not an easy task. It's the consequence of hard work in the different aspects of sports preparation - technical, psychological, physical conditioning and theoretical as well. This process is accompanied by deep structural and functional reorganizations of the human body, manifested as high quality changes.

Sports aerobics as comparatively new discipline has to lean on the scientific achievements of sports like artistic and rhythmic gymnastics, acrobatics, as it comes from them, and we cannot see radical differences in respect of sports preparation.

The main goal of this examination is to create and define a universal method for teaching difficulty elements in aerobic gymnastics.

For execution of the goal, we had number of Tasks as follows: 1. To find out the main supporting points to

give reasons for our methods, 2. To find out the main points in methods' structure, 3. To make pedagogical experiment in real conditions.

METHODS

1. In its initial stage our examination we checked the existing bibliography up to now.

2. Using the scientific achievements of other gymnastics sports we created our methods for training of difficulty elements in aerobics gymnastics.

3. We proved our methods during 2 years real pedagogical experiment. The athletes that have been tested were one of the best Bulgarian aerobics gymnastics competitors.

The main methods of the examination were as follows:

1. Biomechanical analysis.
2. Anatomical analysis.
3. Theoretical analysis and synthesis of the motor movements.
4. Systematically structural approach.
5. Statistical methods.

Main supporting points toward introducing of our methods

Teaching difficulty elements is a complex pedagogical process. Actually, we are trying to control the motor movements of the competitors at all stages of the practical training. Therefore, to substantiate our methods for the training we examined the basic prerequisites for motor movements' education. They became the basics of our teaching methods.

Basic prerequisites for motor movements' education

Physiological mechanism for building up motor habits

The building up of motor habits is a complex physiological process.

The execution of difficulty elements of complex coordination structure in sports aerobics is possible following continuous repetitions of concrete movements or elements. Thus reviewed from the physiological point of view, complexes of temporary nerve connections start to be created in the motor centers of the brain. This is a process of permanent information (internal and external) exchange. According to Gavriiski (Гаврийски, 1983) the central nervous system analyzes and synthesizes this information, compares it to the assigned model of execution, makes corrections, "creates" a program and "sends" it to the motor nervous system for the execution of a specific movement or element. Thus, this mechanism repeats leads toward a perfect execution of elements.

The continuous improvement and automation of the movements is the base of coordination skills development. The degree of coordination abilities depends on both genetic gifts and number of motor skills.

Motor apparatus of the anatomical and functional peculiarities

It is a characteristic for the motor apparatus to improve itself within the process of its activity. Each part of it is modeled, built up and functionally developed; it can reach "morphological and functional perfection" (Morov, Моров, 1990), which is one of the basic features of sport training theory and methodology.

During the execution of a specific motor movement or difficulty element, we observe the participation of various muscles or muscles group. So the knowledge about the motor apparatus provides the possibility to make detailed anatomic analysis, body movement synthesis and, by doing so, to reach high-level control of motor movements.

The complex structure of motor apparatus from the point of view of functional anatomy and biomechanics is another basic characteristic, which is defined by great number of degrees and freedom of movements in the separate kinematic links and the participation of multi joint muscles and muscles groups. Thus, "countless combinations of movements in the separate kinematical links and great number of muscles impulses can solve a specific motor task" (Ivanov, & Gikova (Иванов, & Гикова), 1995).

Biomechanical characteristics of movements

From the mechanics point of view, the human body is a knee-joint system of bound up parts, activated by the muscles (internal motors), having fixed sizes, mass and impulses as well as the structural buildup of motor apparatus is closely related to its functional use. All interactions of the motor system both with internal and external environment are provided by its structure, i.e. the structure reflects directly and indirectly the entirety, effectiveness and perfection of motor movements. The "structural composition of motor movements consists of kinematic (external) and dynamic (internal) structure" Andonov (Андонов), 1987).

The difficulty elements' technique of execution is based on biomechanics rules. Registration and explanation of biomechanical parameters (kinematical and dynamic) reveal the objective laws of execution technique. That is in the base and in the meaning in biomechanical analyses of the motor movements. (Arakchiyski (Аракчииски), 2013).

In his researches Kurierov (Куриеров), 1958) according to Andonov (Андонов), 1987), recommends to divide the difficulty elements conventionally into three main phases – preparation, main and final phase. Gaverdovski, & Tihonov (1965, 1966) according to Andonov (Андонов), 1987), developed methodologically this problem later.

Pedagogical prerequisites

The practical and theoretical training is a pedagogical, well-based process. It is in direct relation to teaching and assimilation of knowledge and depends on the creative use of didactic principles.

The specificity of motor movements' education involves the use of specific training principles. The latter cover dividing the educative material into logical units. The size and content of these units depends on the athletes' individual abilities. This results in a training program, which is based on the theory of programmed education. According to this theory, the process of training is accompanied by permanent information exchange. By using training programs, we combine perfectly the educative content with the way of its assimilation. On the other hand the training programs guarantee operative control by receiving fast information during the time of training.

Difficulty elements' performance by optimum technique

Technical preparation appears to be one of the most important aspects of the sports preparation. Technical preparation is a process, characterized as a systematic, methodological, purposeful and unceasing work for initial learning, assimilating and consolidating, followed by mastering the difficulty elements' technique of execution.

Technical mastership criteria in sport aerobics cover the degree of motor skills stability, performance style and execution of difficulty elements of complex coordination structure.

The basic steps, movement patterns, links, transitions and lifts are the objects of technical preparation as well. Nevertheless, they are appearing to be a base of the specific contents of routines' choreography and they have to be performed by a perfect technique. Therefore a time is needed toward learning and improving.

Sports aerobics technical preparation involves continuing repetitions for improving coordination, proper body posture, orientation in air and style as well.

In general, considering its specific characteristics, technical preparation prevails during the preparation period training and has to be planned and controlled by longstanding training plans.

The same problems are discussed in other sports like wrestling, when technical preparation is very important for the results of the long-term preparation. (Stanchev (Станчев), 2013).

Structure of the methods (main points)

Classification of difficulty elements in aerobics gymnastics

First in our work was to make a Classification of all elements according to aerobics gymnastics' Code of points (2001). It's presented in the Fig.1.

To present our methods for training we will examine a group of the "Jump and leaps family" exercises according to Code of points in aerobic gymnastics. This group represents all straddle jumps elements executed from two legs.

Determination of phase structure

Preparation phase – covers taking start position and preparation for jump.

Main phase – covers explosive jump and movements in flying phase – body folding with straddle legs.

Final phase – covers preparation for landing and landing.

Motor qualities needs

High-level developed motor qualities are needed for executing the elements of the jumps and leaps family. They are as follows:

- Legs strength and explosive power – for execution of a two legs jump:
- Abdominal, frontal upper part of the legs and backward part of the body strength and explosive power – for execution of body folding to straddle and body unfolding movement.
- Full speed arm movements - for execution of arm swing when jumping.
- Arms and shoulders strength for execution of landing to push up position.
- Hip joint flexibility for - execution of straddle legs position in flying phase and landing in split position.
- Coordination skills for execution of difficulty elements of complex coordination structure.

Algorithmic chain for teaching difficulty elements

The algorithmic chain contains 22 difficulty elements (Fig. 2.). There are four main branches, showing the different variants for landing – to split, standing to push up and 1 arm push up. The main indication determining this algorithmic chain is *from two legs - straddle jump execution*. The basic elements are: *straddle jump, straddle jump to split and straddle jump to push up*.

An algorithmic chain has been built on the base of some main principles:

- Gradualness in difficulty increasing of the elements.
- An element in the chain is motor base for learning and execution of the next element.
- Positive transference of motor habits and technical skills.
- Didactic principles.

Using this approach we created 23 algorithmic chains for teaching almost all elements in aerobics gymnastics. If a new element will be created it will be put to the corresponding algorithmic chain in the right place.

Special methodological guidelines (for teaching straddle jump (form two legs jump) family).

- We have to pay attention to the main points of execution. They are: optimal speed up (if it's needed), preparation for jump, explosive jump, movements in flying phase, preparation and landing.
 - Each of the main points of execution must be trained separately and perfectly performed according to general and specific descriptions in Code of points and technique of execution.
 - One of the main moments in technique of execution of straddle jumps family is when jumping – it's very important here to combine the explosive jump with arms' work (swinging).
 - Permanent corrections in respect to technical mistakes and especially the reasons that provoke them.
 - Landing to push up position must be executed first on landing mats and then by supporting on the floor.
 - The basic element (straddle jump) is movement base for teaching of the next elements in the chain.
 - The execution of basic element to standing position is base to perform it with turning, to split and to push up position.
 - Permanent conditioning work, conformable to necessary motor abilities for execution of elements in this group is needed as well.
 - We have to take account of jumps and leaps family's general and specific descriptions and examples of deductions to be made by the execution judges and minimum requirements for difficulty in the new Code of points.
- In broad outlines it was the general points of our methods for teaching difficulty elements in aerobics gymnastics. With respect to teaching single element we have to add some more explanations.

RESULTS

Resulting from series of researches in the sphere of different kinds of gymnastics, a method of training difficulty elements has been created. This method was successfully adapted toward teaching difficulty elements in sports aerobics.

The structure of this method is presented in Fig. 3. It demonstrates the method's three main parts and their optimum correlation during the process of training, thus contributing to attain a perfect technique in the difficulty elements' performance.

Motor base needed

The first part (Motor base needed) covers all exercises and isolated motor movements, needed when starting to learn a specific difficulty element.

For example – to start learning “free fall 1/1 twist airborne to 1 arm push up” the learners have to perform the following elements by perfect technique:

1. “Free fall”,
2. “Free fall to 1 arm push up”,
3. “Free fall airborne ”,
4. “Free fall airborne to 1 arm push up”,
5. “1/1 air turn”,
6. “Free fall 1/1 twist airborne”
7. “1 arm push up”.

8. Abilities for holding tight and straight body position in the air needed as well.

Otherwise, the learners make many mistakes, which will require longer time for learning the element; will bring to wrong technique of execution and most likely injuries and inability to perform the most difficult elements in this group later.

Motor qualities needed (conditioning)

The next part (Motor qualities needed) covers the degree of development of the different kinds of motor abilities. The athletes need these motor qualities, they are necessary for executing the difficulty elements. It is very important to have knowledge about the motor qualities needed in order to start learning the corresponding difficulty element. We examined this point higher up.

Technique building exercises

The 3rd part of the training methodology (Technique building exercises) covers a sequence of specialized exercises. These exercises help learning specific difficult elements. Therefore, the execution of these exercises for a period of time solves the problem of learning and mastering the difficulty elements.

The main issue here is the necessity to select the correct exercises. That involves a good knowledge of difficulty elements' technique of execution. One has to be aware of every minute performance of the elements, the biomechanic characteristics of the movements (kinematic and dynamic) and phase structure.

The next issue relates toward arranging of the technique building exercises in the proper order, thereby

each exercise becomes a stable ground for learning the next exercise of the sequence. This way we will have a kind of pedagogically well-founded teaching program.

1. During the process of difficulty elements' teaching, binding of their different phases can start only following the perfect execution of the technique building exercises. Otherwise, many mistakes could be repeated and it would be very difficult to eliminate them when the athletes perform the complete exercise. Unexpected injuries are possible as well.

It's of extreme importance to perform difficulty elements in favorable conditions and landing mats are to be used or assistance rendered during landing, especially when landing in push up positions.

During the process of learning the technique building exercises and difficulty elements, the mistakes have to be eliminated in due time; and the main reasons for mistakes have to be found. The reasons can be the lack of: strength, explosive power, flexibility, uncontrolled motor movements and wrong arm movements during jumping, improper body position, etc.

General and specific conditioning has to be accompanied in the time of teaching technique building exercises and has to be consistent with the muscles' regime when performing a concrete difficulty element or single motor movement.

Pedagogical experiment

The results of the pedagogical experiment confirmed the practical workability of our methods for teaching difficulty elements in aerobic gymnastics. A great number of elements have been assimilated during our 2 years experiment.

The results of the experiment are pointed in the dissertation of Sergiev, G. (2000) (Сергиев, Г, 2000). The teaching method for elements in aerobic gymnastics was proven conclusively. All recommendations for teaching of all elements in aerobic gymnastics are presented by Gergiev's book (2004).

CONCLUSIONS

1. Examined methods for teaching difficulty elements in aerobic gymnastics was found to be very successful due to its ground and contents.

2. The essence of the methods is to control cleverly different parts of the training process according to the basic prerequisites for motor movements' education.

3. Our opinion is that this methods can be used in other sports for training specific technical skills or motor movements.

4. We recommend this method and we think that it can be used from different kind of sports specialists and will be developed in their practical work.

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