

THE EMPLOYMENT OF BIOMECHANICAL METHODS FOR INSTRUCTION AND IMPROVEMENT OF SPORTS TECHNIQUE

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The instruction in motor skills forming sport technique and their improvements is one of the most difficult problems in motor pedagogics. It is difficult, because the influence of physiological reasons makes the mastering and improvement of these skills almost impossible the performer is not aware of the factors. Moreover, if biomechanical parameters from the beginning of the pedagogical process were correctly carrying out both the value and the time would be worthy.

Otherwise the skill will be mastered incorrectly and as we know, to destroy incorrect skills is difficult it is better to master the new skill correctly from the start.

If we consider that the control of motor skill in a person (and even in an animal) occurs as the result of two circuits where the first - the highest, operates the semantic aspect of movement and the next - the lowest (or the internal) which operates the activity of the specific muscular synergies, that each of these has a special mechanism, in which forms and remains the programme of any movement.

Therefore, the creation of motor programmes is the biological basis of motor skill formation. But if the formation of a programme in the highest level is anticipated by the deliberate activity, the presentation about the movement on the bases (principles) of external information (for man - visual) then, the formation of a programme in the internal circuit which completely connects with the activity of proprioceptors which can be put into operation only during the movement. That's why we have difficulties in formations and improvements of motor skills about which we write.

This complexity connects also with those areas that utilize the correction of parameters to master the movements in the external (semantic) circuit. This easily achieves, by external receptors and correction, the mastering of parameters (mainly biomechanical) in the internal circuit of external receptors. The important practical task of biomechanics is to find a solution of this problem.

We can suggest two ways: the first is the compulsory performance of the movement so, that all internal biomechanical dependence of doer is recognized.

Here we use numerous training equipment and auxiliary apparatus. But we have another way - to transfer the internal parameters of mastered movement in such a form, in order to control these from the side of external receptors (e.g. visual).

It is practical to employ the modern methods of control and investigation of movements, specifically tensometrical, which makes it possible to get all the parameters of internal (power) structure of movement, immediately after its fulfilment, and then draw the performance to the oscilloscope.

We use this method for mastering two complicated sport skills - bicycle pedalling and repulsion while ski-jumping.

In the first case, the curve was displayed on the screen of the oscilloscope which skirted the ends of vector efforts, attached to the axis of the bicycle's pedal (pedalling of course was carried out on the apparatus).

The person who was mastering this difficult skill should look at the oscillograph and exert his power in order to make this curve follow an accepted form. (Fig. 1).

After using some methodical methods the performance was achieved in three or four trainings. The mastering of pushing in ski-jumps - was performed in different way, though in this case we used the tensometric data units and the oscillograph. The man was asked to perform a pushing action from the tensometrical platform, imitating the push from the table in ski-jumping, to see if the curve of force on the oscillograph screen was similar to a required form.

At this time it was necessary for the curve to correspond to the model and after several trainings for it to take on the form and contours.

During the usual training of ski-jump the sportsman can perform on the trampoline 10-15 training jumps and consequently the same number of pushings (the parameters which are not controlled). The performance of pushings

in the form of modelling on the platform can allow one to conduct unlimited quantity in obtaining the stability of structure of this movement (Fig. 2).

It is advisable to use this method in other kinds of sports movements, because we have no doubts that these are successful methods.



Figure 1: The curves skirting the oscilloscope in circular pedalling, after mastering the technology.



Figure 2: The same curves after mastering the skills of pushing from trampoline.