



IMPROVING THE EFFICIENCY OF STUDENTS' SHORT-DISTANCE RUNNING TECHNIQUES BASED ON AN INNOVATIVE APPROACH

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Abstract:

The article briefly describes how to improve the efficiency of students' short-distance running technique based on an innovative approach.

Keywords: Innovation, student, short distance, sport, technique, speed, strength, reserve, energy, distance.

Introduction

Based on an innovative approach, the technique of starting and running over a distance is a decisive factor in the implementation of the speed-power potential of sprinting.

To achieve high results in running, such physical qualities as speed (speed), endurance, speed endurance, coordination (agility) are necessary.

The result depends on how rationally, economically and effectively an athlete can use muscle strength when accelerating from the start and his energy reserves at a distance. What is technique? Usually, the technique of performing sports exercises is described by the external indicators of the movements of certain parts of the human body. From the outside, short-distance running is characterized by the athlete's free, light, heavy, relaxed, strong, intense, low, high and many other definitions. Analysis of kinematics of short-distance running allows for a detailed analysis of the overall picture of the movements, and a consistent analysis of the recorded situations allows for the identification of precise quantitative indicators of the movements (angles, speed, body part displacements). However, such



descriptions are not enough, and even the exact calculation of this information does not yet allow for their practical application. For example, a sprinter has two kinematics of his run. The results are 10.20 and 10.40 seconds, in the first case he managed to win the competition, in the second he did not even make it to the final. If we assume that somewhere the running technique was violated, it is necessary to search for and analyze errors using high-speed filming. Indeed, sprinters usually take 43-48 steps over the distance, which means that when a bad result is shown, he loses about 0.004 seconds from each step. In order to detect a technical error during such a period, the shooting rate should be at least 1000 frames per second, and the use of computer technology is necessary for high-quality processing of the material. Usually, attention is paid to the angle of inclination of the athlete's body, the nature of placing the foot on the platform and its position in the support phase, as well as the position of the knee of the supporting leg in the vertical phase (it should be ahead of the knee of the supporting leg at this time).

Evaluating the external appearance of an athlete's movements in running, or, as mechanics say, studying the kinematics of movements, cannot always provide detailed information. Movement is the result of the contraction of the main motor of human movement - skeletal muscles. When considering the running technique of sprinters, it is necessary, first of all, to understand the internal structure of the movement. The complex anatomical and physiological structure of the human locomotor apparatus currently does not allow for a sufficiently accurate modeling and description of the nature of running. The difficulty is that the general nature of the movement is affected not only by each of the 60 muscles of the legs, but also by a large number of other muscles of the body and arms. In addition, the structure of muscle fibers in humans is different, and if we also take into account morphological characteristics (the total dimensions of the body and its individual parts), it becomes clear how difficult it is to quantitatively describe the main characteristics of the movements of sprinters. Therefore, it is more appropriate to talk not about the model of the ideal movements of a sprinter, but about the general laws of the interaction of muscle groups and muscle contractions during the execution of maximum fast movements by an athlete. The reaction time to the



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signal of the starter is very important for a sprinter, since this time is included in the overall result of the run. Therefore, it should be included in the basis of the training of sprinters, and the shorter the distance, the more time should be devoted to improving reaction time. The athlete's reaction to an acoustic signal depends on the following factors: 1) the intensity of the signal; 2) the rhythm of breathing; 3) the initial warm-up exercises; 4) the age and sex of the athlete (in most cases, men react better); 5) the length of the distance; 6) the athlete's sports experience. It is very important to determine the sequence of movements at the start and what is the possible reserve of time savings at the start. The starter's gunshot serves as a signal to start the movement, but a certain time passes for each athlete before the movement begins. This is called the latent period of the movement reaction (RV - reaction time). Physiologically, the reaction time depends on many factors: the appearance of a signal in the sensory organ, the transmission of the signal to the ends of the nerve fibers, the movement along the nerve bundles, muscle activation, coordination of muscle tissue activity and the external manifestation of the movement. Each of these events occurs at a different time, but is included in the total reaction time. It is known that the speed of sound in the air is approximately 340 m/s. Thus, if the starter is located approximately 15 m from the starting line, the sound waves will reach those standing at the start after 0.05 s. The propagation of sound waves, the transmission of mechanical vibrations to a nerve impulse, the search for a command destination, the conduction of a nerve impulse and the initiation of active activity of muscle fibers - this is the simplified content of the latent period of the motor reaction. It is 0.09-0.11 s in qualified athletes. The start and its basic functions. The main goal of the start in short-distance running is to develop maximum speed over a short distance. When the runner pushes off from the starting footrests, the starting force arises and is divided into two components - vertical and horizontal. The athlete must overcome the inertia of the stationary position by exerting maximum force when pushing off the starting footrests and reacting quickly to the shot. The start of sprinters is associated with an effective push off the footrests and a rapid transition from the start to a run.



Crossing the finish line. According to Donerty (2007), research on the technique of crossing the finish line has been conducted since the beginning of the 20th century. The Englishman Arthur Duffy used the method of throwing onto the ribbon, that is, he threw onto the ribbon with a sharp bend of the body forward and his arms extended down and back. The American Bernie Veferis crossed the finish line by turning one shoulder in the direction of the finish line and simultaneously raising his arm up. Such actions allowed him to gain up to 12 cm over his rivals. In 1904, the American Morton tried the method of jumping into the finish line with 20 yards to go. He took a deep breath and jumped into the finish line while bending forward. In 1920, Charlie Paddock became famous for jumping to the end of the sprint distance. Incorrect actions before the finish line of the sprinter can lead to his defeat. Frye (2002) recommends that athletes do the following when crossing the finish line: - the body position and stride length should be maintained at the same level when approaching and crossing the finish line; - the stride length should be the same as the middle of the distance; - the foot of the swinging foot is placed closer to the projection of the body support UOM; - it is necessary to strive to make the strides faster, not longer; - the sprinter tilts his shoulders forward and down so that he has some length at the finish line itself (this should be done if the athlete takes the last step behind the finish line). In recent years, there are two models of sprinters crossing the finish line: a) the sprinter extends his arms back and tilts his head, quickly thrusting his shoulders forward; b) the athlete extends his opposite arms back and turns his body, which helps him turn his shoulders faster. It is impossible to maintain maximum speed until the end of the distance. A person is able to increase the intensity of work up to 6 seconds, then maintain this intensity for 1-3 seconds, after which the performance capacity inevitably decreases. Approximately 20-15 m before the finish line, the speed usually decreases by 3-8%. The essence of crossing the finish line is that it is necessary to try to maintain maximum speed until the end of the distance or to reduce the impact of negative factors on it. With the onset of fatigue, the strength of the muscles involved in the push-off decreases, the length of the running step decreases, and therefore the speed drops. To maintain speed, it is necessary to increase the pace of running steps, which, as we mentioned



above, can be achieved by the movement of the arms. In distance running, the athlete finishes when he touches the finish line, that is, the imaginary vertical plane that passes over the finish line.

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