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MAKTABGACHA VA MAKTAB TA'LIMI VAZIRLIGI

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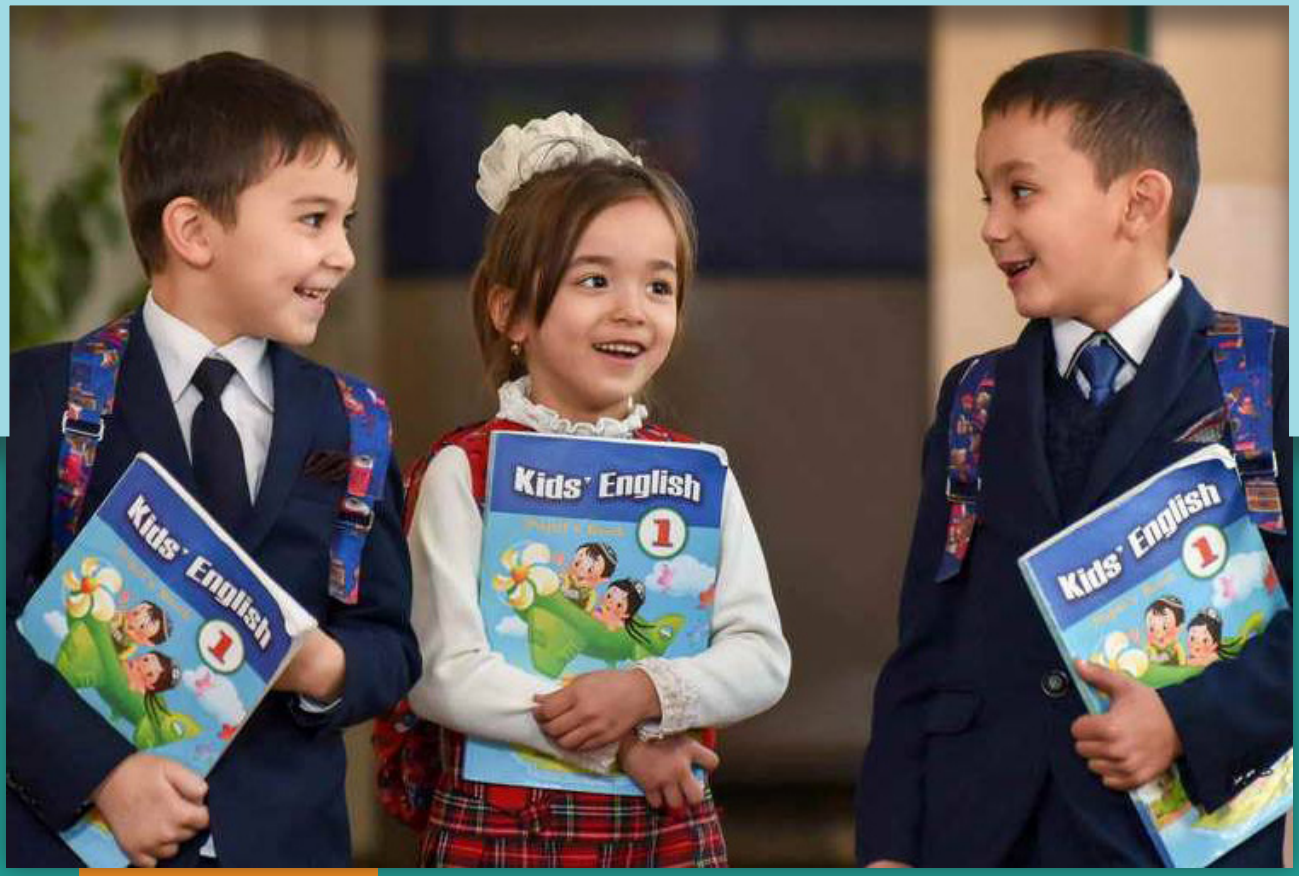

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2025

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MUNDARIJA СОДЕРЖАНИЕ CONTENTS

MUNDARIJA

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IMPROVING HIGH JUMP TECHNIQUES

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(Nukus, Republic of Karakalpakstan)

Abstract: The relevance of this study lies in the fact that, in elite-level high jump, the potential of traditional methods has been exhausted, and further progress can only be achieved through the optimisation of established training factors. The article analyses a key determinant of high performance – the technical efficiency of the run-up. A set of practical recommendations is also presented to improve the training process of high jump athletes.

Key words: Competitive process, athlete, high jump, run-up, technique.

Annotatsiya: Ushbu tadqiqotning dolzarbligi shundan iboratki, yuqori darajadagi balandlikka sakrashda an'anaviy usullar imkoniyati tugagan bo'lib, keyingi yutuqlar faqat mavjud mashg'ulot omillarini optimallashtirish orqali erishilishi mumkin. Maqolada yuqori natijalarga erishishda muhim omil – yugurib kelish bosqichining texnik samaradorligi tahlil qilingan. Shuningdek, balandlikka sakrovchilar tayyorgarlik jarayonini takomillashtirish uchun amaliy tavsiyalar majmui taqdim etiladi.

Kalit so'zlar: Musobaqa jarayoni, sportchi, balandlikka sakrash, yugurib kelish, texnika.

Аннотация: Актуальность исследования заключается в том, что в прыжках в высоту на элитном уровне потенциал традиционных методов исчерпан, и дальнейший прогресс возможен только за счёт оптимизации известных факторов тренировки. В статье проанализирован ключевой фактор достижения высоких результатов – техническая эффективность разбега. Представлен комплекс практических рекомендаций, направленных на совершенствование тренировочного процесса прыгунов в высоту.

Ключевые слова: Соревновательный процесс, спортсмен, прыжки в высоту, разбег, техника.

INTRODUCTION

The attainment of elevated results – and notably record-breaking achievements – in the high jump event is not solely attributable to the athlete's advantageous morphological characteristics, such as elevated stature, pronounced limb length, and minimal body mass. The development of a high level of physical qualities is of key importance – including speed and strength abilities, agility, flexibility (with an emphasis on mobility in the hip joint), and coordination of movements.

LITERATURE REVIEW

Research on high jump techniques has emphasized the central role of the run-up in achieving optimal results. Chistyakov analysed the mechanics of high jump and highlighted that technical refinement of the approach phase determines the success of the take-off and clearance. His early work remains a cornerstone in understanding how biomechanical adjustments affect the athlete's overall performance.

Further studies have expanded this view by examining the relationship between physical preparation and technical mastery. Kengesbayevich stressed that effective training in sports requires not only physical conditioning but also methodological innovations in teaching and coaching. His works on didactics and classification of sports underline the importance of structured training models that integrate physical culture with technical skills development.

Psychological and physiological aspects have also been investigated in relation to high jump performance. Romanyuk showed that the psychological readiness of athletes and the development of model characteristics play a significant role in mastering complex techniques such as the run-up and take-off. This suggests that

successful performance in high jump is not only biomechanical but also closely linked to mental and adaptive capacities.

RESEARCH METHODOLOGY

The duration of the competition – frequently measured in hours – placed greater demands on the athlete's psychophysiological preparedness. It is imperative that jumpers are capable of optimally distributing their physical and mental resources throughout the entire performance – thereby ensuring that they have a significant reserve left for the decisive attempts at maximum heights. It is evident that exemplary exponents of this discipline in the realm of world sports have unequivocally exhibited their prowess in this regard [1].

The running high jump can be defined as a comprehensive motor action – the kinematic structure of which is characterised by the close interconnection and interdependence of all phases. The exercise is comprised of three fundamental phases: the run-up, the take-off, and the flight phase with the transition over the bar. It is important to note that this division into phases – as well as their subsequent decomposition into separate elements – is conditional. Nevertheless, this methodological approach is necessary for a detailed kinesiological analysis and subsequent description of the technique.

The run-up phase is characterised by a sequence of 7–9 running steps, with a distance covered of 11–14 metres. The sequence is initiated by 3–4 preparatory steps – the purpose of which is to preliminarily increase speed to approximately 2–2.5 m/s prior to transitioning to specialised running steps – as well as to ensure rhythmic consistency with the subsequent acceleration. The run-up is performed from the lateral side of the push-off leg, at an angle of 25–35° to the projection of the bar.

The initial segment of the run-up (the first 4–6 steps) does not differ in its biomechanical characteristics from the technique of accelerated running. The progressive increase in speed during this phase is concomitant with an increase in stride length.

It is evident that – at the inception of the preparatory phase – the primary objective is to augment the horizontal velocity. However, as the final 2–3 steps are approached, a novel and pivotal objective emerges: the preparation for an efficacious propulsion. It is imperative that the athlete ensures a seamless kinematic transition from the run-up to the push-off without compromising the forward acceleration. In order to facilitate the smooth integration of the body segments into the subsequent push-off movement, it is imperative that they are positioned in a specific manner [3].

This biomechanical adjustment – initiated by the straightening of the torso and the lowering of the athlete's centre of gravity (COG) on the penultimate step – determines the increase in the length of this step and the formation of the maximum angle of flexion in the knee joint of the swing leg, which performs a supporting function in this phase. It is imperative to note that the position of the shoulder girdle and pelvis in the projection of the support area at the moment of crossing the vertical line drawn through the front part of the foot of the supporting leg is an indispensable condition for the further accelerated forward movement of the CG.

The subsequent dynamics are characterised by the active movement of the pelvis along the 'forward–upward' vector and the placement of the push-off leg at the point of repulsion. At this moment, the movement of the pelvis precedes that of the shoulder girdle, and the upper limbs prepare for a synchronous swing movement. When the pushing leg is placed, the opposite arm is not brought forward but remains in a retroposition – thereby creating conditions for the swing of the free leg forward and upward to be coordinated with the swing of both arms [2].

The reduction in the length of the final step is primarily attributable to the increase in the athlete's centre of gravity when placing the push-off foot and the powerful repulsive action of the swing leg, directed along the 'forward–upward' vector. Furthermore, the reduction in the length of the final stride is influenced by a change in the angle of the torso and a modification in the kinematics of the arm movements. The increase in the length of the penultimate stride – and the reduction in the length of the final stride – in leading athletes has been shown to reach 15–20% of the average length of the last four strides of the run-up. The discrepancy in length between the final step and the penultimate step ranges from 30 to 40 centimetres.

ANALYSIS AND RESULTS

However, despite the increase in the length of the penultimate step, the duration of its flight phase does not exceed that of the previous step. This phenomenon can be explained by a significant increase in horizontal speed and a reduction in the duration of the flight phase – which is a consequence of a deliberate reduction in the height of the OTC. Consequently, the reduction in flight phase time in the final step is attributable not to an increase in speed, but rather to a decrease in step length due to the rise of the OTC and the high speed of the push-off foot landing at the point of repulsion.

The modification of the kinematic structure of movements in the final steps of the run-up – coupled with a transformation of rhythm and tempo characteristics – presents a significant coordination challenge for athletes. It is noteworthy that not all athletes – even those at the highest level of competition – possess the capacity to implement such a biomechanical restructuring in the context of high-speed running conditions. In summary, it can be concluded that there is a direct correlation between the level of physical development and technical skill of each jumper – and the individually optimal run-up speed. Concurrently, an augmentation in run-up speed is only attainable as the athlete's technical training evolves and their physical condition improves [4].

The process of mastering and subsequent refinement of running technique is closely intertwined with the development of the pushing-off skill. The execution of an accelerated sequence of 7–9 running steps – initiated from a preliminary approach of 2–4 steps, without the incorporation of a final push – facilitates the establishment of a stable motor pattern. This pattern corresponds to the rhythm and tempo structure inherent within the run-up. This element is then repeatedly reproduced in integration with the push-off phase – which helps to optimise preparation for its effective execution.

A significant disadvantage of the running start technique for many athletes is the high velocity attained at the commencement of the race – which results in the attainment of peak velocity by the midpoint of the race. Consequently, the preparation for the push-off – and the push-off itself – are undertaken in the context of a progressive decline in horizontal speed, which gives rise to a series of technical errors. These include premature pelvic extension with the shoulder girdle lagging behind, the generation of braking forces on the penultimate step, and passive placement of the push-off foot with insufficiently active swing of the free leg along a forward–upward trajectory.

At the initial stage of technical improvement, another common error is the premature and excessive lowering of the centre of mass (COM). This low running style has been shown to hinder the athlete's ability to effectively exit the penultimate step and make a powerful transition to the push-off. This, in turn, has a detrimental effect on their kinematic and dynamic characteristics [5].

CONCLUSION AND SUGGESTIONS

Consequently, the methodological support for enhancing the run-up in high jump comprises three fundamental training tasks:

1. The reproduction of the kinematic structure of the run-up – over a distance of 7–9 running steps – is to be conducted, with the take-off phase being isolated.
2. It is imperative that the three final steps of the run-up and take-off are executed in unison – with particular emphasis placed on the rhythmic and dynamic interrelation between them.
3. A comprehensive modelling approach was employed to analyse the motor action – encompassing a complete run-up and initiation of take-off without the flight phase over the bar.

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