

CASE STUDIES

Application of mechatronics systems to 110 meters hurdles training – a case report

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Abstract

Background. The idea behind the study is that the structure of the 110 meters hurdles tryout includes a relatively large range of technical elements, which, by their assembly, involves drivelines in motion and offers the chance to study different kinematics parameters. This tryout reveals a high degree of technical complexity, involving ample resources in training techniques in order to improve the training methods.

Aims. This research concerns the analysis of the hurdles runner's step technique at the case study level. Reporting experimental research on this case contributes to a very positive effect in improving technique based on extrinsic feedback.

Methods. In this research, the kinematics parameters of the hurdles runner's pace obtained by comparing data are dependent on the investigation conducted by the video analysis method.

By using the video analysis method, record processing methods were highlighted, methods based on a video analysis software which emphasised the possibilities of capturing and observing the technical execution of hurdles runner's stride by changing each sequence in time and by transferring the sequences in descriptive points per millimetre sheet. This allows the specialized information to be operated upon and organised, thus obtaining precise qualitative and quantitative evaluation.

Results. The progress of the values to kinematics parameters F2 and F3 shows that the work focused specifically on existing faults, positive values of 8° upturn being registered at the moment of the hurdle attack and 12° in the downward phase when landing after the hurdle.

Conclusions. Based on the performance achieved by the athlete (junior national champion, I, 60 mg - 8.16 sec., 2011) the kinematics parameters values obtained are important factors in the efficiency of the hurdles runner's stride.

Keywords: sports training, kinematics, technique, 110 meters hurdles race.