The 13th International Scientific Conference
eLearning and Software for Education
Bucharest, April 27-28, 2017
10.12753/2066-026X-17-202

USE OF E-TRAINING IN MATHEMATICAL MODELING OF THE BIOMECHANICAL CHARACTERISTICS OF DOUBLE BACK SOMERSAULT ON THE FLOOR

Vladimir POTOP, Valeriu JURAT, Victor BUFTEA
Ecological University of Bucharest, str. Vasile Milea nr.1G, Romania
State University of Physical Education and Sport, str. Andrei Doga nr. 22, Chisinau, Moldova
vladimir_potop@yahoo.com, valeriujurat@mail.ru, bufteavictor@mail.ru

Viorel DORGAN
State University of Physical Education and Sport, str. Andrei Doga nr. 22, Chisinau, Moldova
third_author@xyz.net

Abstract*: The purpose of this paper is to develop a mathematical model based on the use of e-training in the technical preparation of acrobatic elements on floor in women's artistic gymnastics. This scientific approach has led to the organization of an experimental study, using the research methods as follows: analysis of specialized scientific literature; computerized video method by means of "Pinnacle Studio" program of capture and video processing; also "Kinovea" and "Physics ToolKit" programs for biomechanical video analysis of sports technique; method of mathematical modeling; method of postural orientation of movement; statistical method, using "KyPlot" computerized program. A number of 13 athletes aged from 12 to 15 years, all of them members of junior national team of Romania, participated in this research, which was conducted from 2012 to 2014. In this regard, 36 double back somersaults performed in three national competitions were analyzed in terms of biomechanics; the results of the kinematic and dynamic characteristics and the performances achieved in competitions were statistically correlated. It has been highlighted the linear correlative significance of the kinematic and dynamic characteristics for the translation with rotation movement, in accordance with the anthropometric, biomechanical and performance indicators of junior gymnasts of 12 to 15 years old, for developing the mathematical model of double back somersault in women's artistic gymnastics. The effective use of e-training in the mathematical modeling of the biomechanical characteristics of sports performances created the possibility to deepen the phasic preparation of sports training and the more efficient processing of the modern didactical programs of learning.*

Keywords: *Acrobatics; kinematics; dynamics; statistics; performance.*

I. INTRODUCTION

In current conditions, the sport and the potential for performance suffer deep changes with major implications not only in the strategies of sports selection and training but also in terms of training methods [1]. The same happens in artistic gymnastics where, throughout the Olympic cycles of training, it is created the concept of its development and improvement, the argumentation of the methodology allowing an effective multi-annual training [2, 3, 4].

The main trends characteristic for women's artistic gymnastics are the increase of the difficulty of competitive programs on apparatus, the increase of execution mastery quality, the geographic broadening of gymnastics development worldwide and the increase of the number of countries; the lead is taken by the improvement of the competition events and the increase of the number of exercises belonging to structural groups of different difficulty [5, 6, 7].