

Development of motor skills of students with the help of the training simulator "belts with rings"

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Abstract:

The article examines the effectiveness of the development of motor skills of students using the training simulator "Belts with rings". To determine the level of development of the motor qualities of students, the first stage of the research was carried out two types of exercises. The first type is 4 tests of physical exercises, such as pulling on the crossbar; push-up from the floor, a long jump from the seat; shuttle race 4x9 m. The second type is tests of biomechanical testing methods, such as stabilography – "Ski slope", and tensodynamography – "Jump up from the seat". In the experiment on the development of motor skills of future specialists participated 328 students aged 17-18 years, women and men, in their oral agreement. 20 students who had the best results formed a model group (MG), 8 students who had the worst results eliminated on the first phase of the experiment. Students with other results had formed a homogeneous overall group (OG) in an amount of 300 people, which was divided into two groups: a control group (CG) and experimental group (EG) of 150 students each, 75 male students and 75 female students in every group. This paper presented the results of male students. The author's method of development of motor skills of students with the help of the training simulator "Belts with rings" on which students were engaged was developed. Using of the training simulator "Belts with rings" raises the effectiveness of the development of motor skills and gives good results. In order to develop motor skills and increase the level of preparedness of students is recommended to use the training simulator "Belts with rings".

Key words: tests, research, content, benchmarks, exercises, effectiveness, group, results.

Introduction

Education is the leading area in the socio-economic, health, educational and cultural development of Ukraine, which at the present stage of development is undergoing significant changes under the influence of social processes: democratization, globalization and integration. Therefore, one of the ways to expand educational environment of our state is to create conditions for improving the quality of education (Nosko M, 2003).

An important role in this process is belong to higher education (Bielski, 2005), which is providing appropriate intellectual, educational qualification of future professionals, actively promotes their personal development, the full realization of their creative and labor potential (Litovchenko, 2012).

Sufficient attention is also paid to the problems of training of future experts of physical training and sports. The current level of professional readiness of future physical education and sport specialists puts high demands on their physical health and training, which is based on the effective using of motor skills of students, and resources of physical education. An important factor that promotes pedagogical skills of specialists in physical education and sport is the level of mastering the movements of samples according to their own individual motor skills. That's why, mastering the abilities to implement large amount of various motor exercises is an integral part of professionally-activity and reflective components of future physical education and sport specialists (Vashchenko, 2016). Motor activity in the field of physical education and sport is largely determined by the ability of the human to economically and high effectively maintain a certain posture, and change them achieving harmony in the arms. Rational movements and postures determine the result of human activity (Garkusha, 2014; Nosko Y., 2014).

The level of formation of motor skills effects on the outcome in sports (Lazarenko, 2014). To achieve high results in sport we should train enough and skillfully (Ніцше, 1998). Psychological qualities that determine success in sport are necessary (Lysenko, 2011). Of not less importance are the following aspects: optimization of physical load in compliance with requirements of sport training theory (Boychuk, 2017).

In working with students, the trainer, according to his pedagogical decision, should be based on the following: objective quantitative and qualitative Assessment of individual characteristics of students (Zaporozhanov, (2015). Restructuring of physical education in the education system is one of the factors of

motor functioning of students (Ivashchenko, 2016). The efficiency of physical training of students is enhanced by the improvement of the educational activities of the process, if you stick to the formula the information – knowledge – image – comprehension – practical implementation – skill (Plisko, 2016).

Technical means of training and simulators for the training of future specialists are widespread. From a pedagogical point of view, training simulators are teaching means, manners and methods of teaching in solving motor tasks, have pedagogical training property, and created by the laws of pedagogics and allow avoiding motor errors (Zelenin, 2014). A group of scientists (Lazarenko, Nosko, Troyanovska & Semenov, 2014) of Chernigiv National T.G. Shevchenko Pedagogical University has developed a new training simulator "Belts with rings". Successfully used dumbbell training simulator "Belts with rings" in the formation of motor skills and skills of schoolchildren in the process of ski preparation (Lazarenko, 2017).

The hypothesis is suggested that using training simulator "Belts with rings" for the development of motor skills of students using biomechanical control methods not only changes the level of development of motor skills, but also the results of physical fitness, which positively affects the physical condition and the result of the competition.

Methods

Participants

In the experiment on the development of motor skills of future specialists participated 328 students aged 17-18 years, women and men, in their oral consent. According to the results of the experiment, 20 students who had the best results formed a model group (MG), 8 students who had the worst results eliminated on the first phase of the experiment. Students with other results had formed a homogeneous overall group (TG) in an amount of 300 people, which was divided into two groups: a control group (CG) and experimental group (EG) of 150 students each, 75 male students and 75 female students in every group.

This paper presented the results of male students.

Procedure

The study was conducted in 2015-2017 in the laboratory of biomechanics and sports halls of Chernigiv National T.G. Shevchenko Pedagogical University. To determine the level of motor skills of students, the first stage of the research was held – the stating research studies using biomechanical testing methods (Laputin, 1993,1994, Klymenko, 1968): stabilography (Boloban, 2003; Zula, 2015, Troyanovska, 2015) – "Ski slope" (Figure I, IV); on the 4 tests of physical exercises (Romanenko, 2005; Donec I., 2012; Kozeluk, 2012), – pulling up on the bar, push-up from the floor, long jump from the seat, shuttle run 4x9 m (Figure II, V).

The test "Ski slope" of students (Figure I) based on the results of correlation analysis of which, models of biomechanical parameters of support reactions figures, which form a circle, were built. It is a rule, the lower the score the better result is, except the coefficient of equilibrium function (CEF), in which the bigger the index – the better the resistance of common center of mass (FMR) of student body is.

Indicators show that MG was created by the students with the best results.

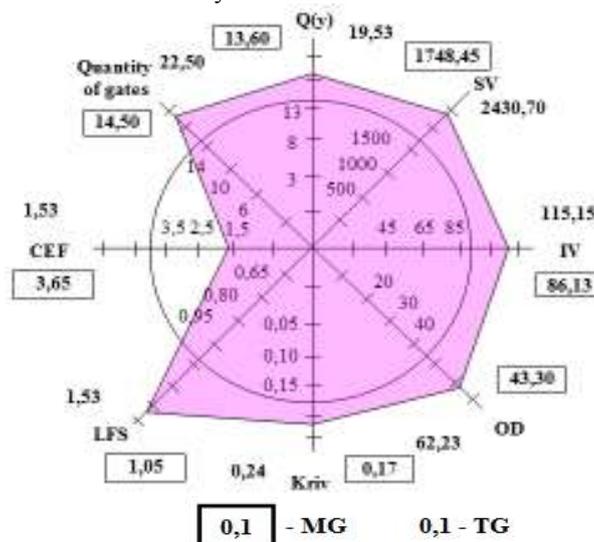


Fig.1. Semi graphical biomechanical model of the structure of the test "Ski slope"

As a result of indicators we can see such a difference between students MG and TG for MG: variation in sahitali (Q (y) – 69, 64%; rate of change in the statokinesiogram area (SV) – 71, 93%; the average peak value speed was (IV) – 74,79%; motion estimation (OD) – 69,74; curvature coefficient (Kriv) – 70, 83; length depending on the area (LFS) – 68, 62%; coefficient of equilibrium function (CEF) – 41, 91%; quantity passed the of gate – 64, 44%.

The level of development of motor skills of the students determined the level of special physical measurements on motor characteristics: strength, agility and speed.

It was analyzed rates of physical readiness of students. State of force preparedness determined by the results of pull-ups on the bar and push-ups on the floor. Power is one of the most important qualities that determine the possibility and effectiveness of motor activity of a student. State of power-speed muscles of the lower extremities characterized by the results of long jump from their seats. When the test is crucial "explosive power", characterized by the ability to exercise maximum efforts for the least amount of time. It is crucial in motor activities that require large muscle tension.

Speed and agility are qualities that affect the success of learning new motor actions and improve their lessons form; there were determined by the results of 4x9 shuttle run.

Indicators of physical readiness of students from MG and TG during tests are shown in Figure III.

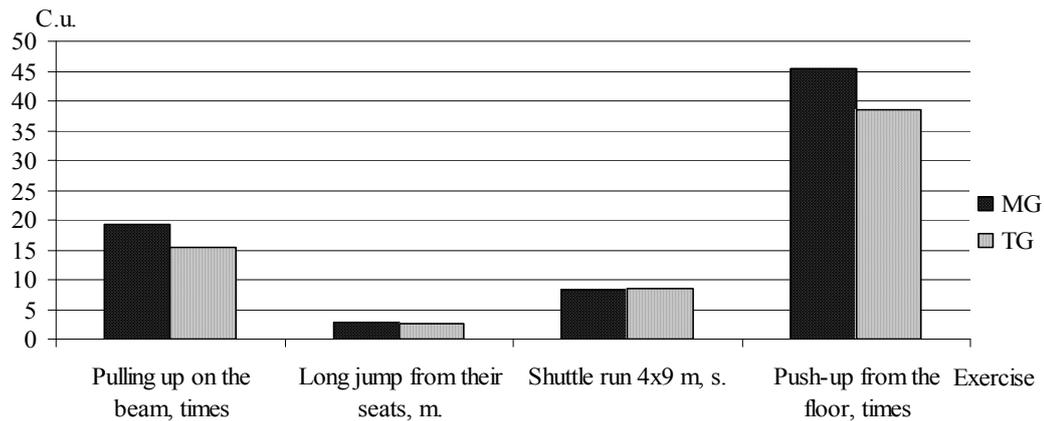


Fig. 2. Indicators of physical readiness of students from MG and TG during tests

Analysis of the test results showed that students of MG have better performance than students of TG.

The difference in the results of students shown in Figure 2 in favor of MG was: pulling up on a crossbeam – 24.67%; long jump from place – 7.5%; shuttle run 4x9 m – 4.71%; push-ups on the floor – 17.92%.

Different methods and means are used for the development of motor skills using, but for the first time, for the effective development of motor skills of students, it was applied authorial training simulator "Belts with rings", which has been tested in the national team of Ukraine in biathlon and received positive reviews.

It was designed author's method of development of propulsion qualities of students with "Belts with rings" training simulator" (Table 1).

Table 1. Methods of development of motive qualities of students using the training simulator "Belts with rings" (Fragments)

Task	Teaching methods	Content of the class	Dosage	Benchmark	
1. Train movements of legs, arms and torso during exercise on the training simulator "belts with rings". 2. To develop motor quality strength, endurance and agility.	Session 1	1. Theory 2. Workout. Overall training exercise. 3. Implementation of special strength exercises Exercises on the training simulator "Belts with rings" 4. Final part	5 min 20 min 60 min 5 min	Q(y) mm	13,60±1,04
	In the gym: (Preparatory part)			Pulling on the bar times	12,8±1,33
				Push-ups on the floor	33,5±14
	Circular			Long jump from place	1,83±0,21
Promotion	Shuttle run 4x9 m	8,2±0,74			

The exercises on a training simulator "Belts with rings", thanks to the action of gravity and body weight, can improve coordination and promote the development of strength, agility and endurance [8, 9]. The presence of springs stretching and two pairs of belts with the four rings makes it possible to perform strength exercises for arms, legs, neck and body together or separately, which contributes to the efficiency of physical fitness of students.

Combinations of exercises can be different and will not take much time.

During the exercises in the horizontal position, there is an effect of trembling body, which promotes the breakdown and release of fat and cholesterol plaques of the cardiovascular system.

A set of 20 exercises (Figure III).



Fig. 3. Exercises on training simulator "Belts with rings"

(Fragments) A – horizontal height, B – bending and straightening the arms, C – bending body, D – dilution arms and legs to the side, E – hang squats emphasis behind, bending and straightening hand, F – hang squats emphasis behind, breeding legs sideways.

Classes held four times a week for 90 minutes. Exercises were performed with alternating loads on the muscles of the hands, legs, back, and abdomen. A year later, after the introduction of this methodology, it was carried out the second imaging study for the same tests.

Statistical analysis was fulfilled with the help of Excel program.

Results

After a year of classes to determine the effectiveness of using the training simulator "Belts with rings", it was conducted an experiment using stabilography, strain-gauge measurement, tests and exercise methods. It was compared the results of students from CG and EG (separately).

Quantitative indicators show the following: students of EG had a significant improvement, they are as close to the model that describes the positive development of motor skills of students using stabilography (Fig. IV), and tests with physical exercise methods (Fig. V).

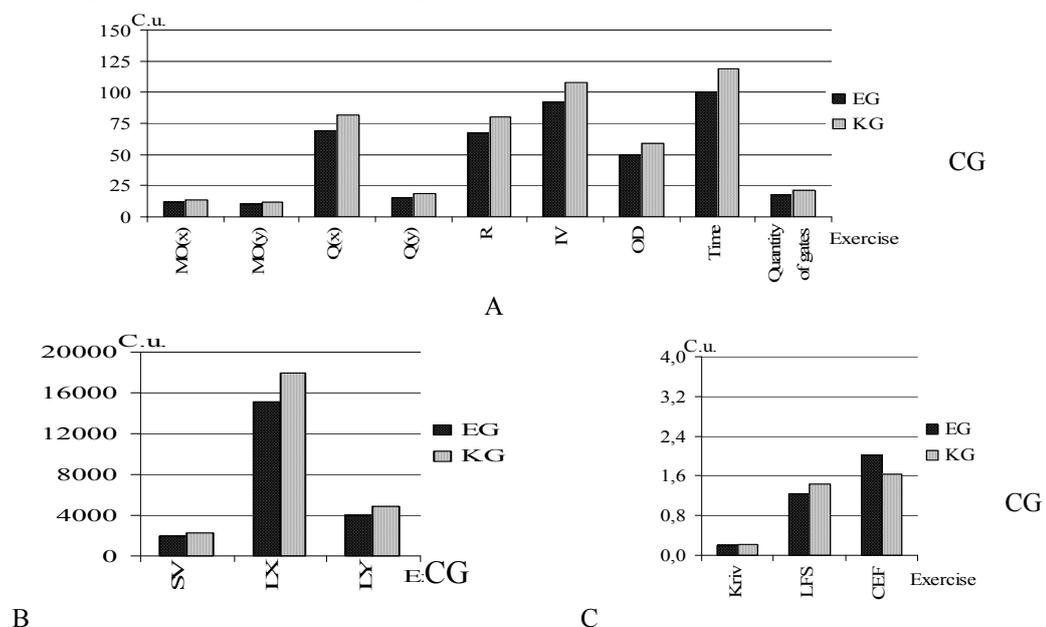


Fig. 4. A, B and C. Biomechanical stability indicators of strain-gauge measurement of EG and CG students during the test "Ski slope"

In this study, the test "Ski slopes" the lower the figure the better result, except CEF index, which index the more the better result.

Therefore, using the training simulator "Belts with rings" can effectively develop motor skills of students.

This is confirmed by test results of exercise during the forming experiment where students of EG parameters revealed significantly better performance compared to students of KG (Fig. V).

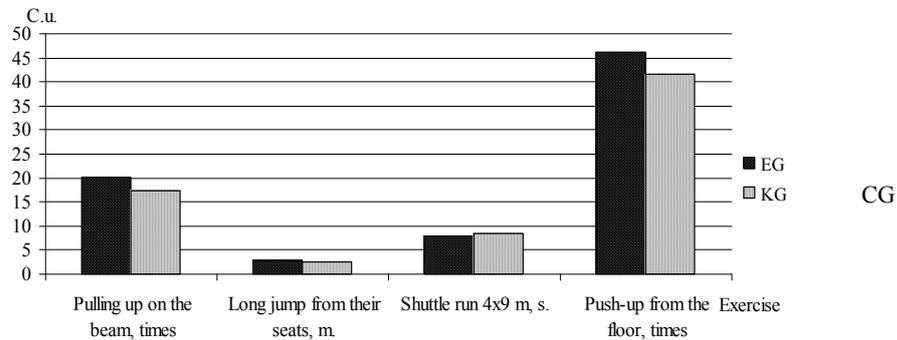


Fig. 5. Indicators of physical fitness of students from EG and CG in the tests physical exercise

Comparative analysis of the development of motor skills of students (Fig. V) showed that students of EG it better than students of CG. Statistically significant changes identified in terms of: pulling on the bar – 16,76% ($P < 0.05$); push-ups on the floor – 10,81% ($P < 0.05$); long jump from place – 6,56%; shuttle run 4h9 m – 6,03% significant changes were found ($P > 0,05$).

Discussion

Analyses, systematization of scientific and methodical literature and practical experience suggests that the problem of development and implementation into pedagogical process using of training simulator "Belts with rings", aimed at effective formation of motor skills and abilities of students of the Department of Physical Education, is not studied enough. The training simulator "Belts with rings" is tested and widely used in biathlon, skiing, gyms, the quality of movement of students; develop more effective than with other simulators. Despite the surprise before the new simulator of many students, the results of the study confirmed the effectiveness of the use of the training simulator "Belts with rings".

Author's technique of development of motor qualities of students in the preparatory process is an integrated motor qualities system based on the implementation of strength training, biomechanical indicators of psychological components of motor control actions, as well as other features of the pedagogical performance of motor actions.

The novelty: a special series of studies (Lazarenko, 2014, 2017) with pedagogical skills and analysis of performance of various exercises, and stabilography and strain gauge measurement tests allow to determine effective use of the training simulator "Belts with rings" in the development of motor skills of students.

The knowledge and pedagogical skill of the teacher, taking into account psycho-emotional status of the student, allow using the necessary exercise, the speed and the number of execution allows the student to show a good result, which confirms the efficiency of the use of the training simulator "Belts with rings."

Conclusions

The literature sources on the topic of research were analyzed. However, the problem of development and implementation in the educational process tools, methods and new simulators aimed at developing of motor skills of students is not sufficiently studied.

For the first time, it was developed and put into practice a technique of development of motor skills of students using the training simulator "Belts with rings."

The efficiency of the use of the simulator "Belts with rings" during the development of motor skills of students because of forming experiment using stabilography methods and tests was asserted.

The students of the EG compared with students of CG had significant changes and seizing in the tests: stabilography – "ski slope" to 17,88%. Results of exercise tests the students of the EG also found a significantly better compared to those of CG of students.

With the aim of effective development of motor skills of students, it is necessary to use pedagogical issues to choose the right, appropriate to the type of sport, age and sex exercises on the training simulator "Belts with rings."

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