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## THE DEVELOPMENT OF SPEED AND ACCURACY OF THE GAME ACTIONS OF STUDENTS IN BASKETBALL USING SPECIAL SIMULATORS

The article shows the possibilities of using technical equipment in the physical education of students, analyzed the properties of special training devices as an additional means of pedagogical influence in physical education classes in higher education institutions. It is stated that simulators are available for use in classes with people of different sex, age and fitness. The use of simulators allows you to simulate conditions that correspond to exemplary performance indicators, which determines the integral and qualitative performance of exercises, even at the initial stages of training techniques. It is confirmed that today a variety of training simulators are being tested and popular for the improvement of technical techniques and acts of attack and protection in basketball.

The necessity of introduction of training devices in basketball classes for the teaching of technical techniques and development of motor skills of students is substantiated. The special "Shooting duable" simulators are proposed to improve the accuracy of throws in the basket and "Dribble stand" to improve the ball's speed of students who play basketball, describes the principle of their use in the educational process. The developed training devices present increased requirements for visual control in a limited area of the working surface, which creates the prerequisites for improving the spatial-muscle sensation and the formation of a dynamic stereotype of movements. It is determined that the developed simulators act on the principle of combined influence and can be used at all stages of basketball training for students of different levels of technical skill.

**Key words:** students, basketball, simulator, technical skill, speed of dribbling, throw precision.

**Ж. Г. Дьоміна Michael I. Kalinski Є. О. Кузенков О. В. Тимошенко Розвиток швидкості і точності ігрових дій студентів у баскетболі з використанням спеціальних тренажерів.** У статті показано можливості застосування технічного обладнання у фізичному вихованні студентів, проаналізовано властивості спеціальних тренажерних пристроїв як додаткового засобу педагогічного впливу на заняттях фізичними вправами у закладах вищої освіти. Обґрунтовано необхідність впровадження тренажерних засобів на заняттях з баскетболу для навчання технічних прийомів та розвитку рухових якостей студентів. Запропоновано спеціальні тренажери «Shooting duable» для покращення точності кидків у кошик та «Dribble stand» для підвищення швидкості ведення м'яча студентів, які займаються баскетболом, описано принцип їх використання в освітньому процесі.

**Ключові слова:** студенти, баскетбол, тренажер, технічна майстерність, швидкість ведення, кидкова точність.

**Ж. Г. Демина, М. И. Калинин, Е. О. Кузенков, А. В. Тимошенко. Развитие скорости и точности игровых действий студентов в баскетболе с использованием специальных тренажеров.** В статье показаны возможности применения технического оборудования в физическом воспитании студентов, проанализированы свойства специальных тренажерных устройств как дополнительного средства педагогического воздействия на занятиях физическими упражнениями в заведениях высшего образования. Обоснована необходимость внедрения тренажерных средств на занятиях по баскетболу для обучения технических приемов и развития двигательных качеств студентов. Предложено специальные тренажеры «Shooting duable» для улучшения точности бросков в корзину и «Dribble stand» для повышения скорости ведения мяча студентов, занимающихся баскетболом, описан принцип их использования в образовательном процессе.

**Ключевые слова:** студенты, баскетбол, тренажер, техническое мастерство, скорость ведения, бросковая точность.

**Problem statement, relevance of the research.** Technical equipment - devices, systems, apparatus used to train and improve physical exercise techniques, develop motor qualities and control in the educational process - are employed for solving problems of physical education of students and increase effectiveness of physical exercises. These technical aids include exercisers meant to specially simulate and program the movements in laboratory conditions, which increase the effectiveness of training sessions without gain of the volume and intensity of physical activity. In sports games great importance belongs to technical preparedness including a large number of different techniques. One of the main conditions for gaming performance is the speed and accuracy of technique and action implementation. Basketball is one of the most popular types of students' health and physical training. The content of basketball classes is distinct in the variety of motor actions, the flexibility of game situations, the nature of the

game lies in dynamism, emotionality and high motor density. The basis of individual technical skill in basketball is the speed of handling and the accuracy of shots.

The traditional method of developing the accuracy and speed of gaming actions in basketball involves frequent repetition of techniques in different conditions and game activities, and therefore, it is quite monotonous in the application of means and methods of teaching techniques of physical exercises and improving students' motor fitness.

Simulators in the educational process allow achieving the effect of combined influence on motor abilities and skills and solve simultaneously the task of studying basketball techniques, development of special physical qualities, purposeful influence on sensory systems, psychophysiological indicators of the learners. Such devices are available for people of different gender, age and fitness. The use of machines allows you to simulate the conditions compliant with exemplary indicators of movement effectiveness, which results in coherent and qualitative performance of exercises, even at the initial stages of teaching techniques.

The above justifies the necessity of introducing simulators into basketball classes in the process of physical education of students of various levels of gaming skills as a tool of intensifying the educational process.

**Analysis of recent research and publications.** Researches by V. Y. Voldoziorov, O. A. Sbitneva, T. M. Redko, A. V. Khokhlov, and others. [1; 3; 4; 5] prove that special exercise equipment for physical exercises with students has a number of advantages enhancing the effect of traditional physical education aids, namely:

- 1) provide execution of the movement according to the given parameters and structure in conditions of severe dosing of physical strain;
- 2) facilitate improvement of inter-muscular coordination, elimination of excessive activity of muscles not involved in the movement;
- 3) exclude the possibility of negative influence on the musculoskeletal system;
- 4) selectively affect various muscle groups, including those that are extremely difficult to expose to training effects during exercise;
- 5) provide an opportunity to clearly program the structure of movements, as well as the nature and amount of the specific load;
- 6) allow performing movements at different modes of muscle work;
- 7) create conditions for the formation of kinesthetic feel when mastering separate phases of motional task;
- 8) provide more complete learning of biomechanical characteristics of movements;
- 9) reduce the probability of mistakes in the technique of performing exercises;
- 10) practically exclude injuries and mental tension during motion task execution;
- 11) increase motor density of exercise;
- 12) allow adjusting for the individual peculiarities of the students;
- 13) effective for use in the process of independent work;
- 14) activate the process of self-control, that is deliberate assessment of the final and interim results of their own activities;
- 15) stipulate a clear program of action for the control and management of the educational process.

The advantages the simulators suggest that the future of technologies development for training movements and development of motor qualities is connected with them. One of the ways of intensifying the physical education of students is the introduction of non-traditional means of training and increasing physical condition, in particular the use of various devices [2].

Currently training simulators for improving techniques and actions in the attack and defense in basketball by A. Z. Dobrushin, V. A. Ivansky, V. M. Kudimov, A. Mironov, V. M. Pritykina, K. M. Charikova etc. are successfully tested and much sought after. Given the high variation of motor activity in basketball and the correlation of successful mastering of the game technique and the psychophysiological indicators of a sportsman's body development, the urgency of developing new, accessible and effective simulators to enhance technical skills in the process of basketball training is beyond any doubt.

**The research target** is to develop special simulators to increase the basketball students' speed of handling and the accuracy of shots and reveal the peculiarities of their use.

**Presentation of the main research material.** In order to improve the students' precision, in the process of basketball training a special simulator "Shooting duable" was developed (Fig. 1). The device contains a metal ring 380 mm in diameter (diameter of a basketball ring: 450-457 mm) fixed on top of the basketball ring by shock absorbers. "Shooting duable" is aimed to increase the accuracy of shots due to the concentrated action of the visual and tactile analyzers when the area of the hit zone is limited. The proposed technical tool contributes to the accuracy of the basketball throw made in any way, except throw down. Concurrently eye estimation and space orientation get developed. The principle of using this device is the following: students perform throws into the ring by re-serial method with the gradual complication of the task – a gradual increase in distance, attempts to throws from different points of the playing court. The author's development of "Shooting duable" can be effectively applied to students of various training levels both during the initial training of basketball throws and for improving their accuracy.



Fig. 1. Simulator "Shooting duable" for increase the accuracy of shots in the process of basketball training

A special trainer "Dribble stand" has been developed to improve the technique of ball handling and improve performance speed (fig. 2). It is a plastic rack 180 cm wide with three crossbars located at a height of 50 cm from the floor at 90-120 angle and is intended for training a crossover - a sharp transfer of the ball from hand to hand with a stroke on the floor.

Ball handling in basketball (dribbling) is considered the second main way of moving the ball around the court after the handoff; this is why the highest level of mastering this technique is the basic principle of ball control in the gaming activities.

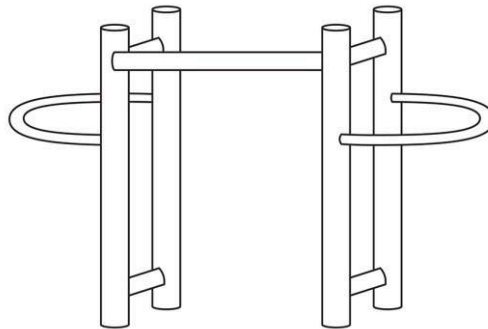


Fig. 2. Simulator "Dribble stand" to improve the technique of ball handling and improve performance speed.

The device is a simplified simulation of defender's hands and is used to study the handling technique in controlled conditions by forming muscular sensation of the ball. The simulator allows practicing various handling styles: with high rebound of the ball from the court surface and 135-160° angle of bending the player's knees; with low rebound hiding the ball and bending player's knees at 90-120°; dribbling combined with crossover. Variability of handling is ensured by improved hand coordination manifested in the ability to quickly transfer the ball from one hand to another, balance of the body - a sense of balance, frequency of hand movements (tempo).

Moreover, exercising with the simulator also strengthens leg muscles, as dribbling is performed in half-knee bend position. The design concept provides the possibility of adjusting height of the crossovers, which allows practicing dribbling by expanding the variations of manipulations with the ball at different heights. Thus, proposed "Dribble stand" tool contributes to acquiring correct technique of basketball throw and allows avoiding mistakes in the already acquired ability, in particular, too high rebound of the ball.

The "Dribble stand" simulator has the following principle of application: a student takes up a balanced basketball stance, his legs are bent at 50-60° angle and performs crossovers in such a way that the ball passes under the stand. Three cross-bars of the stand for dribbling allow simultaneous practicing techniques in different directions, changing them at random or at teacher's signal.

Exercises can be performed on different tasks: against the clock or the number of successful attempts. At the initial stage of training simulator session is 20-30 sec. with 2-3 min. pauses for rest in series of 5-6 sets. During in-depth crossover study the exercise is complicated by combination with other elements of dribbling, as well as by extension of exercise duration or number of sets, reducing pauses for rest.

With intent of control, it is convenient to choose exercises with performance result allowing to assess the level of students' technical skill. For example, the effectiveness of "Shooting duable" can be estimated by the number of hits out of 10 shots from the middle distance or out of 10 foul shots; as a control test on the "Dribble stand" simulator the number of crossovers in 15 seconds can be accounted.

Proposed exercisers relate to the means of combined effects simultaneously solving pedagogical tasks of development of special motor qualities and training basketball techniques. The proposed training devices call for increased visual control in a limited working area providing for improving the spatial-muscle feel and the formation of movement pattern.

**Conclusions.** Thus, "Shooting duable" and "Dribble stand" simulators are proposed in order to increase basketball players' dribbling speed and accuracy of shots; the principles of their use in the educational process are described. The suggested devices work on combined influence principle and can be applied at all stages of the training for students of different levels of technical skill.

**Prospects for using the research results and further exploration.** Developed simulators can be used in the educational process of physical education of students of higher education establishments for basketball training. In future an experimental verification is planned to prove effectiveness of the exercisers to improve the performance of students who play basketball.

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#### ORGANIZATIONAL AND PEDAGOGICAL CONDITIONS OF PROFESSIONAL DEVELOPMENT OF PHYSICAL TRAINING TEACHERS IN THE CONDITIONS OF POSTGRADUATE PEDAGOGICAL EDUCATION

*It is stated in the article that at the level of structure of organizational and pedagogical conditions is the openness of educational environment of institutions of postgraduate pedagogical education for introduction of innovations into the process of professional development of physical training teachers; the level of andragogical competence of teachers, which ensure the process of professional development of physical training teachers in the conditions of postgraduate pedagogical education. At the level of content, the organizational and pedagogical condition is the selection and structuring of the content of the education of professional development of physical training teachers in the conditions of postgraduate pedagogical education in accordance with the integration processes. At the level of teaching technology, organizational and pedagogical conditions are integrative-differentiated organization of occupations in the process of professional development of physical training teachers in postgraduate pedagogical education with the use of modern teaching technologies; regular change of the nature of activity in the process of training, based on personal experience of the students, their individual motivational orientation; organization of independent work of listeners as a means of formation of professional competences.*

**Key words:** professional development of physical training teachers, postgraduate pedagogical education.

**Войтовська О. М. Організаційно-педагогічні умови професійного розвитку вчителів фізичної культури в умовах післядипломної педагогічної освіти.** У статті обґрунтовано, що на рівні структури організаційно-педагогічними умовами є відкритість освітнього середовища закладів післядипломної педагогічної освіти для впровадження інновацій в процес професійного розвитку вчителів фізичної культури; рівень андрагогічної компетентності викладачів, які забезпечують процес професійного розвитку вчителів фізичної культури в умовах післядипломної педагогічної освіти. На рівні змісту організаційно-педагогічною умовою є відбір й структурування змісту освіти професійного розвитку вчителів фізичної культури в умовах післядипломної педагогічної освіти відповідно до інтеграційних процесів. На рівні технології навчання організаційно-педагогічними умовами є інтегративно-диференційована організація занять в процесі професійного розвитку вчителів фізичної культури в умовах післядипломної педагогічної освіти з використанням сучасних технологій навчання; регулярна зміна характеру діяльності в процесі підготовки з опорою на особистий досвід слухачів, їх індивідуальну мотиваційну спрямованість; організація самостійної роботи слухачів як засіб формування професійних компетенцій.

**Ключові слова:** професійний розвиток учителів фізичної культури, післядипломна педагогічна освіта.

**Войтовская О. Н. Организационно-педагогические условия профессионального развития учителей физической культуры в условиях последипломного педагогического образования.** В статье обосновано, что на уровне структуры организационно-педагогическими условиями является открытость образовательной среды учреждений последипломного педагогического образования для внедрения инноваций в процесс профессионального развития учителей физической культуры; уровень андрагогической компетентности преподавателей, обеспечивающих процесс профессионального развития учителей физической культуры в условиях последипломного