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Optimization of accelerated learning technique sport diving students of higher educational institutions

Abstract. Purpose: optimizing the learning process engineering sport diving students of higher educational institutions on the basis of experimental detection features changes leading factors in teaching swimming. **Material and Methods:** the study involved 102 students of higher educational institutions. Kharkov. All subjects were divided into groups: experimental and control. **Methods:** theoretical analysis and synthesis of data specific scientific and methodological literature, educational tests, methods of functional diagnostics, pedagogical experiment, methods of mathematical statistics. **Results:** according to the results of peer reviews of sports engineering methods of navigation, the best results achieved experimental group students. Performance analyses of functional tests that assess the cardiovascular and respiratory systems were higher in the experimental group students than the control. **Conclusions:** developed an innovative system of accelerated learning technique sport diving students, creates favorable conditions for the improvement of physical development and physical fitness, providing a faster increase athletic performance.

Keywords: training, equipment, swimming, student.

Introduction. The rational system of movements is understood as a technique of sports swimming which allow reaching the highest sports results. The technique of sports swimming is extremely variable, it develops constantly and updates on each of preparation stages [3; 4; 8; 9].

The main signs of technical skill – are effective, qualitative, with big “step”, economic and reliable swimming movements which are carried out at optimum speed with the maximum use of power and physical capacities of a sportsman [2; 7].

According to data of the special literature, the method of the improvement of components of technology of swimming – a speed and a step of a stroke proposes their consecutive solution – at the beginning the work directed on the increase in a step of a stroke by the improvement of dynamic and kinematic characteristics of the main movements at rather stable speed, the increase of power opportunities of muscles is performed, then the accent of the work is displaced towards the increase in the rate of movements at an aspiration to keep the reached step level [1; 5; 6; 10].

The long-term experience on training of students of higher educational institutions by sports ways of swimming gives the grounds to claim that the traditional approaches to training in swimming which developed so far for a number of reasons are insufficiently effective. It is connected, first, with the absence at coaches in a certain degree of due consideration to the initial motive experience of students, their preparedness for successful mastering of skills of swimming, and, secondly, with ignoring of the fact of variability of modern technique of sports swimming. The formation and the increase of technical skill of students in swimming depend on the development of their functionality, the growth of physical and psychological fitness. It is known that the structure and the nature of movements come to a harmonious compliance with morphological and functional features of an organism engaging swimming. The crucial importance is gained by well thought over the modern system of the bringing and special technical exercises in water helping to create a complex of necessary feelings, perceptions and motive ideas of an optimum option of movements.

Considering and using these features, we developed and experimentally proved the methodical scheme of complex training in technique of sports swimming which is allowing teaching students to float quicker and more effectively. The improvement of technique of sports swimming was carried out further in the conditions of the specially organized training process constructed on the basis of a wide use of micro and mesocycles of a selective orientation [3; 8].

Communication of the research with scientific programs, plans, subjects. The research is executed

according to the plan of RW of National law university “Yaroslav the Wise law academy”.

The objective of the research: to optimize the process of training in technique of sports swimming of students of higher educational institutions on the basis of the experimental detection of features of change of the leading factors in training in swimming and structures of preparedness of sportswomen.

Material and methods of the research. 102 students of Kharkov higher education institutions who chose the specialization swimming took part in the researches which were conducted during the academic years 2013–2014. During the real research the following methods were used: theoretical analysis and synthesis of data of special scientific and methodical literature; control and pedagogical tests; methods of functional diagnostics; the analysis of indicators of a state of health of students on medical records (Rose’s questionnaire); the stating and forming pedagogical experiment; methods of mathematical statistics.

The scheme of the accelerated training of students in technique of sports swimming includes five elements which solve specific objectives by the application of the specific training means. The duration of grade levels varies depending on the digestion of educational and methodical material by students. The differentiated system of the accelerated training of students in swimming is based on complex, simultaneous training in technique of all sports ways of swimming. The complete-separate approach to the development of basic elements of technique of sports swimming is used. The accelerated training in swimming has an advantage over a traditional (parallel-serial) method of training at the expense of the increase in the general (till 97%) and motive (till 72%) density of each practical classes, and also the increase for a course (on 45%) of the applied technical exercises.

The development of technique of sports ways of swimming by students of the control group was carried out by a parallel-serial method. The technique of swimming at examinees was estimated in the sports way on a 5-mark scale by seven experts in the system developed by us.

The expert assessment of technique of swimming was carried out by a crawl on a breast on 29 components, a breast stroke – 25, a crawl on a back – 24, a dolphin – 23 components (the technique of movements by hands, by feet, by breath, by coordination of movements, etc. separately was defined).

Results of the research and their discussion. By results of expert estimates 8,9% of engaged in the experimental group, 41,8% of engaged in the control didn’t master the technique of swimming in all sports ways. Students of the experimental group authentically in a large number mastered the equipment of a dolphin (on 8%), a crawl on a back (on 12,8%) and a breast stroke (on 14%), in comparison with epy representatives of the control group. The students of the control group studying the technique of sports ways of swimming on a parallel-serial method had lower marks. They mastered the technique of start from a starting curbstone, technique of turns much worse. It is established that they need an extra time for the high-quality development of technique of sports ways of swimming (table).

Results of expert estimates of technique of swimming at students of the experimental group (n=52) and the control (n=50) group

Way of swimming, distance	Number of the students who mastered:							
	Ways of swimming, %			Starts, %				
	EG, n=52	$\bar{X} \pm m$	t	p	EG, n=52	$\bar{X} \pm m$	t	p
Crawl on a breast, 25 m	EG, n=52	98,5±1,1	2,12	<0,05	EG, n=52	96,3±1,1	2,59	<0,05
	CG, n=50	95,1±1,2			CG, n=50	92,1±1,2		
Crawl on a back, 25 m	EG, n=52	99,6±1,2	2,92	<0,05	EG, n=52	98,4±1,2	2,44	<0,05
	CG, n=50	95,8±1,1			CG, n=50	94,1±1,3		
Breast stroke on a breast, 25 m	EG, n=52	99,0±2,5	3,51	<0,01	EG, n=52	99,3±0,9	2,5	<0,05
	CG, n=50	84,6±3,3			CG, n=50	95,8±1,1		
Dolphin, 25 m	EG, n=52	94,1±1,9	2,6	<0,05	EG, n=52	99,1±1,1	2,17	<0,05
	CG, n=50	86,1±2,3			CG, n=50	95,4±1,3		

The detailed analysis of the obtained data showed that the best development of the technique of sports ways of swimming happened at the students of the experimental group (at the expense of the increase (for the whole course of studying) of time allowed for the studying and the improvement of technique of exercises (on 16,6%), and the significant increase – on coordination of movements (on 75%)).

The effectiveness of the compared training methods most accurately is expressed in an integrated indicator – the time of overcoming of control distances at the end of training. The analysis of indicators at a control distance of 25 m at the examinees who are trained on a method of the accelerated training and parallel-serial, revealed essential distinctions. The students of the experimental group have an average time of overcoming of a distance of 25 m a dolphin on $2,1 \pm 0,32$ s, a breast stroke – on $1,9 \pm 0,51$ s less, than the control group. Distinctions are statistically reliable ($P < 0,05$). Indicators of a special endurance at students of the experimental group are much higher in comparison with data of the control group. Results of total time in exercises of 8x50 m freestyle which are on 5s less testify to it. It indicates the higher level of technical preparedness and high-speed endurance, and also the stability of movement skills which remain at students of the experimental group at intensive loadings.

The interrelation and interdependence of the structure of movements in water and the level of the development of physical qualities is an important methodical condition of the improvement of technique of sports swimming. The development of the power potential realized in the conditions of the water environment has a crucial importance for the improvement of movement skills, the increase of working capacity and sports productivity in swimming. It is experimentally proved that the draft force in water in full coordination of the movement developed by students of the experimental group is more when swimming by a breast stroke on a breast on $3,2 \pm 1,95$ kg and $3,4 \pm 1,81$ kg when swimming by a dolphin, than at students of the control group. Coefficient of coordination is reliable above at the students of the experimental group when swimming by a dolphin on 10%, a breast stroke – on 8%.

The testing was held for perspective sportswomen right after the termination of a course and the students are selected for classes in the group of the increase of sports skill.

The improving and training orientation of the developed innovative system of the accelerated training in swimming is confirmed by more expressed positive changes in a state of health of students of the experimental group, in comparison with the control group. Incidence, during researches, at students of the experimental group, in comparison with the control, was on average on 19,5% lower. At 82% from them a rather good mood, a health and a dream, desire to do swimming were observed. During the pedagogical experiment the gain of indicators of a complex total score of the level of health at students of the experimental group made 27% and was authentically above (on 7%), than at students of the control group [2].

Results of the analysis of the functional tests used in the pedagogical experiment revealed the changes connected with the formation of a syndrome of «economization of functions» and indicate the best adaptability of the cardiovascular system at examinees of the experimental group when performing physical activities.

The considerable improvement of the activity of respiratory functions is defined at students of the experimental group. Their indicators of a vital index increased on $16,5 \pm 0,78$ ml·kg⁻¹ after a course and initial sports preparation that is reliable above, than at students of the control group ($8,2 \pm 2,50$ ml·kg⁻¹).

A breath delay duration on a breath increased on $17,6 \pm 2,64$ s, and an exhalation on $14,5 \pm 1,91$ s and was authentically best of all, than at students of the control group. The informative indicator of a functional state (PWC170) was authentically above (on 6,4%) at examinees of the experimental group after the termination of the second year of sports preparation.

Conclusions. The offered method of the accelerated training in technique of sports swimming and further sports training promote the strengthening of health of students, create favorable conditions for the improvement of physical development and physical fitness, provide a fast gain of sports results in swimming.

It is expedient to use this system of practical training of students in the educational process in higher educational institutions.

Prospects of further researches. It is supposed to investigate the influence of the offered technique on the growth of sports results of swimmers.

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