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Original article

METHODOLOGICAL ASPECTS OF LEARNING THE FREESTYLE SWIMMING AT PHYSICAL EDUCATION AND SPORT SUBJECT IN THE HIGHER EDUCATION OF OTHER PROFILES

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Abstract

Objective. The main purpose of this paper is the effective use of the algorithmic diagram of linear and branching programmed learning of the freestyle swimming (front crawl) by the first-year students in higher education of other profiles during the physical education and sport classes.

Methods. Methods of research used: bibliographic study of the specialized literature, pedagogical observation, experimental study, method of tests, method of linear and branching programmed learning, statistical-mathematical method and graphical representation method. This scientific approach led to the organization of an experimental study in „Carol Davila” University of Medicine and Pharmacy of Bucharest during the academic year 2015-2016. The subjects of the research were 70 students of first-year (24 from the Faculty of Dental Medicine and 46 from General Medicine) who choose to learn the freestyle swimming method during the physical education and sport classes. The lessons were intended to improve the muscle strength in the control tests for arms, legs and abdominal muscle strength. Specific exercises were used in each class during the off-water training of the students. Preparatory, aiding and control exercises were used during the on-water training, for learning and improving the freestyle swimming method.

Results. The results of the comparative non-parametric correlative analysis of the study reveal strong connections between the total number of lessons per week and semester, the performances achieved in competitions at the freestyle event and the results in test events of the female students of Dental Medicine Faculty. There are insignificant differences (weak connections) between the first-year students of the General Medicine Faculty and the (female and male) students of both faculties.

Conclusions. The efficient use of the preparatory, aiding and control exercises within the algorithmic diagram for learning the freestyle swimming method at physical education and sport subject for first-year students contributed to the improvement of technique and the successful participation in sports events.

Key Words: swimming, freestyle, algorithmic learning, test events, performance.

Introduction

The activity of Physical Education and Sport in higher education includes several forms of organization and carrying out (Sakizlian, 2012; Voinea, Iacobini, Iacobini, 2013): practical lessons, training lessons, Medical Physical Culture lessons and internal competitions of the institute.

The swimming practice arouses a general interest, in the academic environment inclusively, so more and more students practice it lately (Urichianu-Toma, 2003; Sima, 2011).

In order to make possible the practice of a highly attractive swimming, involving also the students with medical exemption, the activity of physical education in faculties of other profile needs a revision of concept, norms and test events necessary for students' evaluation (Lupu, 2009; Marinescu, Bălan, Țicală, 2010).

The adequate facilities at national level are scarce and the swimming pools open in faculties are very few. There are not sufficient scientific and methodical concerns in the higher education of other profiles for introducing and deepening the knowledge of the basic elements of swimming technique and also the methods to learn and improve these elements. That is why an important number of young people do not have a minimum level of motor skills, abilities and knowledge for practicing this sport (Urichianu, 2004; Sima, 2011, 2018).

Currently, didactic technologies designed for the most efficient carrying out of the instructional-educational process in sport and physical education science are used as follows (Gaverdovskij, 2007, Boloban, 2013; Potop, 2015): pedagogic functional equations, multidisciplinary particulars of the creation of the motor skills, technology of transfer, algorithms of the linear and branching programmed

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learning of the instructional material, biological reverse connection in learning (verbal-motor, visual-motor, vestibular-motor).

The main purpose of this paper is the effective use of the algorithmic diagram of linear and branching programmed learning of the freestyle swimming (front crawl) by the first-year students in higher education of other profiles during the physical education and sport classes.

Hypothesis of the paper: the efficient use of the preparatory, aiding, control and correction exercises within the algorithmic diagram of the linear and branching programmed learning of the freestyle swimming in the Physical Education and Sport discipline in the first-year students will contribute to the technique improvement and the successful participation in competitions.

Methods

Methods of research used: bibliographic study of the specialized literature, pedagogical observation, experimental study, method of tests, method of linear and branching programmed learning, statistical-mathematical method and graphical representation method.

This scientific approach led to the organization of an experimental study in „Carol Davila” University of Medicine and Pharmacy of Bucharest during the academic year 2015-2016.

The subjects of the research were 70 students of first-year (24 from the Faculty of Dental Medicine – 6 girls and 18 boys) and 46 from General Medicine –

9 girls and 37 boys) who decided to learn the freestyle swimming method during the physical education and sport classes.

The lessons were intended to improve the muscle strength in the control tests for arms, legs and abdominal muscle strength. Specific exercises were used in each class during the off-water training of the students. Preparatory, aiding and control exercises were used during the on-water training, for learning and improving the freestyle swimming method.

A linear and branching programmed learning curriculum for freestyle swimming was created for the first-year students of the „Carol Davila” University of Medicine and Pharmacy of Bucharest. The elaboration of the algorithms of the linear and branching programmed learning was based on the concept of Prof. Boloban, V. (2013) and adapted to the specific features of swimming (Urichianu, 2004; Ganchar, 2006; Marinescu, Bălan, 2007; Marinescu, Bălan, Țicală, 2009; Sima, 2011).

Results

In tables no 1 and 2 are introduced the results of the test events non-parametric correlation with the attendance and the improved freestyle swimming of the female and male students from Dental Medicine Faculty and General Medicine Faculty in „Carol Davila” University of Medicine and Pharmacy of Bucharest – made by means the KyPlot program, using Spearman Rank Correlation.

Table 1. Correlation of the test events with the attendance and the improved freestyle swimming of the female students from Dental Medicine Faculty and General Medicine Faculty in „Carol Davila” University of Medicine and Pharmacy of Bucharest (DM, n = 6; GM, n = 9)

Rho (corrected for ties); Two-sided Probability	Attendance (no. of lessons) -Improved freestyle (sec)		Test events (reps no in 30 sec)					
			Abd		Arms		Legs	
	DM	GM	DM	GM	DM	GM	DM	GM
Attendance (no. of lessons)	** .706;	-.058;	** .179;	-.181;	** -.268;	-.269;	** .045;	-.206;
Improved freestyle (sec)	.0028	.9042	.0028	.676	.0028	.544	.0028	.620
			** -.027;	.538,	** -.348;	.008;	** -.324;	.084;
			.0028	.1257	.0028	.9216	.0028	.8011

Note: DM – Dentistry Medicine, GM – General Medicine, reps no - number of reps, Abd – abdomen, Legs – Lower limbs, pt.-points; Nonparametric Correlation Spearman Rank Correlation; ** (P<0.01) (two-sided) ; P - Two-sided Probability

Table 2. Correlation of the test events with the attendance and the improved freestyle swimming of the male students from Dental Medicine Faculty and General Medicine Faculty in „Carol Davila” University of Medicine and Pharmacy of Bucharest (DM, n = 18; GM, n = 37)

Rho (corrected for	Attendance (no. of	Test events (reps no in 30 sec)
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ties); Two-sided Probability	lessons) -Improved freestyle (sec)		Abd		Arms		Legs	
	DM	GM	DM	GM	DM	GM	DM	GM
Attendance (no. of lessons)	-.206;	.241;	.7435	.7923	.6773	.9902	.6895	.064
Improved freestyle (sec)	.4327	.1447	-.282;	*-.338;	-.185;	-.258;	.091;	-.017;
			.1017	.044	.2994	.1331	.562	.9417

Note: DM – Dentistry Medicine, GM – General Medicine, reps no - number of reps, Abd – abdomen, Legs – Lower limbs, pt.- points; Nonparametric Correlation Spearman Rank Correlation; * (P<0.05) (two-sided) ; P - Two-sided Probability

The analysis of the results of the non-parametric correlation in the first-year female students of the Dental Medicine Faculty (DM) and General Medicine Faculty (GM) (table no.1) highlight (Rho; P) strong connections at $P < 0.01$ between attendance (no. of lessons) and improved freestyle swimming (sec) in the female students of DM where $Rho = .706; .0028$; attendance (no. of lessons) and test events (reps no in 30 sec) in the female students of DM – abdomen at DM in which $Rho = .179; .0028$, arms - $Rho = -.268; .0028$ and legs – $Rho = .045; .0028$; improved freestyle swimming (sec) and test events (reps no in 30 sec) in the female students of DM where $Rho = -.027; .0028$, arms – $Rho = -.348; .0028$ and legs – $Rho = -.324; .0028$. Regarding the other connections between attendance, improved freestyle swimming and test events in the female students of GM, there are poor connections at $P > 0.05$.

The analysis of the results of the non-parametric correlation in the first-year male students of the Dental Medicine Faculty (DM) and General Medicine Faculty (GM) (table 2) reveal (Rho; P) strong connections at $P < 0.05$ between the improved freestyle (sec) and abdomen where $Rho = -.338; .044$. The other connections between attendance (no. of lessons) and improved freestyle (sec) and test events in the students of DM and MG point out the weak connections existing at $P > 0.05$.

These insignificant differences (weak connections) in both female and male students are caused by the inconsistency between the number of lessons and the performances achieved in competitions (shorter is the time, better is the performance) while the test events have a better result if the number of resp is higher.

In figure no. 1 are shown the algorithms of the linear and branching programmed learning of the freestyle swimming in the first-year students of the „Carol Davila” University of Medicine and Pharmacy of Bucharest.

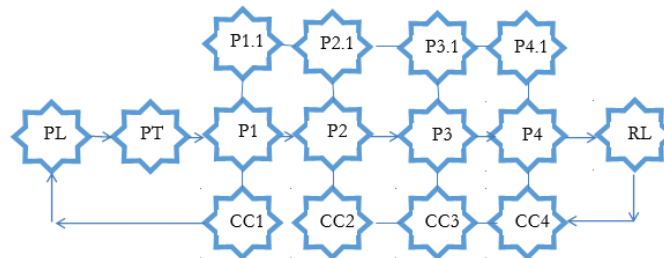


Fig. no.1. Algorithm of linear and branching programmed learning of the freestyle swimming in the first-year students

Note: PL – Purpose of learning, PT - pedagogic tasks, P1-P4 – parts of the instructive material (preparatory exercises for learning the freestyle swimming): P1- technique of floating and front slip , P2- coordination of arms, P3 – coordination between arms –legs, P4 - coordination between arms – breathing; P1.1-4.1 – supplementary parts of the instructional material with preparatory-aiding character: P1.1 – exercises for learning the floating and front slip, P2.1 – exercises for improving the arms coordination, P3.1 – exercises for learning the coordination between arms and legs, P4.1 – exercises for improvement of coordination of arms with breathing; CC (C1-4) – control and correction of the learning process for each technical element of the procedure; RL – result of learning.



Discussion

According to Onoprienko, B.I. (1961) the analysis of the swimming styles technique is necessary for highlighting separately the power of the sweep movements and their sum in the real possibilities of the swimmers in any swimming style. These possibilities are determined depending on the energy expenditure, twice bigger in butterfly and breaststroke swimming styles than in the freestyle and backstroke swimming styles (Troup, Sharp, Plajsh, et al., 1982). Therefore the requirements in terms of development of the muscles that ensure the movement execution get higher (Shhavlev, 1969).

In order to improve the technical training of the swimmers, a special attention must be paid to the modeling of the rational movement in swimming sports procedures (Hal'jad, Tamp, Kaal, 1986). So the coaches must use during training those theoretical and practical recommendations made in the scientific research papers (Kistjakovskij, 1972; Makarenko, 2000).

The improvement of the sports technique of the swimming styles is made depending of the particularities of the swimming movements, the evolution of the swimming styles and classification of the swimming styles used in practical activity (Lopuhin, 1991).

The research on technical training structure of the swimmers specialized in distances of the complex swimming reveals that the fatigue and the switching of the progressive movement execution are important basic factors that determine the changes of the technical parameters (Petrenko, 1984; Volegov, 2000).

The increase of the sports mastery in swimming, even at high performance level, depends on the development of velocity-strength possibilities of the swimmers and is determined by their capacity to make the sweep movements. Hence it is important to focus the attention during learning and training on the segments left behind in swimmers' preparation regarding the development of the velocity and strength (Gilev, Ratov, Beljaev, 1985; Chistova, Fomichenko, 1996; Fomichenko, 2000).

In the practice of the methodology of sports exercises learning, the specialized literature uses the notion of "macro-methods" which can be applied to swimming too. It involves a dynamic system of the theoretical and practical-methodic materials used in the sports training process; the priority structural element is represented by the long-term learning programs based on the logic-structural diagrams and the algorithms of the linear and branching programmed learning necessary for the distribution

of the instructional material (Boloban, 2013; Potop, 2015).

Conclusions

The results of the comparative non-parametric correlative analysis of the study highlight strong connections between the number of lessons per week and semester, the performances obtained in competition in the freestyle swimming events and the test events taken by the female students of the Dental Medicine Faculty.

The insignificant differences concerning the poor connections in the (female and male) students from Dental Medicine and General Medicine are due to the discrepancy between the number of present lessons, the performances obtained in competition and the number of reps in the control events. They had not a negative influence in the achievement of the learning curriculum.

The efficient use of the preparatory, aiding, control and correction exercises in the algorithmic diagram for freestyle swimming learning within the Physical Education and Sport classes in the first-year students contributed to the improvement of the technique and the successful participation in competitions, which validates the hypothesis of this research.

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