ARENA-JPA, ISSN 2285-830X
5, pp. 116-128, 2016

Methods and Means Regarding the Learning of Swimming in Pools of Different Depths

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Abstract
Swimming plays an outstanding role in the daily life of contemporary man. Its hygienic and recreational importance has favourable effects upon the body and consequently strengthens health. In order to gradually reach the intensity and a huge workload in case of the performance sport necessary to a world-wide competitive swimmer the initiation from a very early age is needed along with the learning, if possible, of the four correct swimming techniques in the shortest possible time. This is achievable only through the creative use of the existing conditions, organisation and correct training, by choosing the most efficient methods and teaching means and the judicious use of the time devoted to the training classes. By using adequate means during the initiation process we will get very good results and stimulate courage, self-confidence, increase of work capacity as well as the avoidance of monotony providing a greater variety and complexity. I do consider that the use of water games in going through the fundamental steps of the specific initiation (getting used to the water, learning of the basic technical elements (floating, breath, gliding), learning of the leg and arm movements and the co-ordination of the legs movement with the arms movement and breath are of utmost importance.
The goal of this paper is to prove that the initiation of swimming in deep water is as efficient as the initiation of swimming in shallow water.

Keywords
Methods, game, floating, breath, gliding, pools with different depths.

Introduction

Using correctly structured exercises for learning the basic technical elements (floating, breath, gliding) as well as learning the gliding process in case of front crawl and backstroke and using the most efficient teaching methods and means (game) a more rapid and correct learning will be achieved from the very beginning; this will lead to a considerable shorter time for learning swimming.

During childhood and adolescence, physical education at school offers an excellent opportunity to learn and practise skills necessary for the improvement of the physical condition and health during life time. These daily activities may include swimming and other sports games.

In the White Paper on sport (European Commission, 2007), the Commission has underlined the fact that the time spent for practicing sports activities as part of the physical education classes both at school and as part of the extracurricular activities may produce substantial beneficial effects on education and health. The promotion of the physical education in schools implies the introduction and adjustment of the policies whose goal is the increase of the general awareness of the long life social and education value the physical education and sport play. In many countries, such an action requires a strategic and rational approach in order to mobilize the young to recognize this principle and create the opportunities for them to take part in physical activities. The European countries adopt different approaches to develop physical education and physical activity promotion strategies. The herein experiment has taken place in Hungary where swimming is included in the curriculum starting with the 1st grade of the primary school. In Hungary swimming represents a national interest activity along with other seven priority sports. There is a huge interest of schools in supporting the practicing of swimming.

In Hungary, the latest reform that has been implemented starting with the school year 2012-2013 increased the number of compulsory physical education classes and offered the students the opportunity to practice sports and physical activities five times a

week. In the lower secondary education system the time devoted to this subject has doubled. Moreover, a more flexible time schedule will allow schools to include in their curriculum alternative forms of sports activity, as swimming, dancing and horse riding. Such activities may be practiced twice a week, out of the five classes in total, in some cases within the school sports clubs. (Tóth Ákos, 2002, *Úszásoktatás*, Semmelweis Egyetem Testnevelési és Sporttudományi kar, Budapest, p. 23).

The training process in the performance sports aims at a continuous increase of the exercise capacity in order to ensure both the withstanding in good conditions of a greater quantity of mechanical work during training and allowing the achievement and maintenance of the effort at the highest possible level during competitions. (Silviu Salgau, Gheorghe Marinescu, 2005, *Adaptarea efortului si programarea la inotatori",* Editura Tehnopres Iasi, p. 8).

Methods

The experiment consisted in the application of some methods and means in order to learn and reinforce the basic technical elements and learning of the front crawl and backstroke techniques. It took place at the Swimming Centre at Ketegyhaza (Hungary) and we worked on two groups (experimental and control), each made up of 10 children aged 5 to 7. Each group consisted of 5 girls and 5 boys. Taking into account that at this age the morphological functional differences are insignificant and that they were all beginners I may consider that they all belong to the same statistical sample.

The subjects have been selected according to the following criteria:

- to be a disciplined group with a regular attendance of the classes;
- to work according to a common plan so that all the subjects use the same training means, methods and the exercises are personalized in accordance with their morphological and physiological characteristics;

- in order to measure progress we used the arithmetic mean as a statistical indictor at the final tests.

During the experiment, children were individually guided and we worked according to the swimming technique teaching and reinforcement methods. The swimming course comprised 12 lessons of an hour and a half each. They took place three times a week from Monday until Friday for four weeks. The experimental group used the deep pool for their activity while the control group the shallow pool.

The analytical learning involves the learning of the swimming technical procedures by increasing gradually the learning of the technical structures specific to the swimming procedures and in the end reaching the achievement of the co-ordination of the component parts and the global performance of swimming procedure. (Jivan Ioan Sebastian, 1999, *Inot – tratat metodic* Editura Printech Bucuresti, p. 87).

During the 12th lesson the children were submitted to the control tests. The marks were from 1 to 5, 1 standing for unsatisfactory, 2 – satisfactory, 3 – average, 4 – good and 5 – very good or excellent.

The control tests were the following:

- breaststroke – pushing off wall;
- backstroke – pushing off wall;
- breaststroke with front crawl legs movement;
- backstroke with back legs movement;
- breaststroke with front crawl legs movement, the right arm stretched forward and the left arm along the thigh;
- breaststroke with front crawl legs movement, the left arm stretched forward and the right arm along the thigh;
- backstroke with back legs movement, the right arm stretched forward and the left arm along the thigh;
- backstroke with back legs movement, the left arm stretched forward and the right arm along the thigh.

Moving in water using a specific technical procedure is achieved by moving the arms, also called paddling. In all technical procedures arms have a propulsion role and in the front crawl technique they also get an elevation from water role. (Luciela Carla, 1999, *Inot*

aptitudinile psihomotrice si pregatirea tehnica, Editura Printech, p. 113).

The components of the operational model comprised the following driving and algorithm systems used during the training lessons:

- Exercises for a harmonious physical development;
- Water games – regarding the fundamental stages of specific training (getting used to the water, learning of the basic technical elements – floating, breath, gliding), learning of the arms and legs movement, the co-ordination of the arms and legs movement and breath;
- Exercises for learning the front crawl and backstroke technique.

The objective of the training programmes has been to produce metabolic and psychological adjustments allowing the swimmers to swim better. (Maglischo, E. W., *Swimming fastest*, Ed. Human Kinetics Publishers, Inc. 2003, p. 85).

From the point of view of the statistical analysis we have used as statistical indicators the arithmetic mean, the amplitude, the average deviation, the standard deviation, the variability coefficient which can provide us with conclusive data on our experiment. Conclusions have been drawn after quantifying the differences of the tests performed upon the control and experiment groups.

Results

The experimental results have been organized in tables, statistically processed and interpreted according to the methodology of the physical activity research methodology. The evolution recorded during the learning process and the reinforcement of the basic elements in swimming along with the learning of the front crawl and backstroke technique (in gliding) obtained by the studied subjects are shown in the following tables:

Tabel nr. 1. The results of control samples of the **control group** conducted in shallow water

THE CONTROL GROUP (shallow water)							
The subject of the research	**Year of birth**	**Sex M/F**	**Age (years)**	**Sliding crawl with push the wall – T1**	**Sliding crawl, crawl with legs exercise-T2**	**Sliding crawl, with left arm extended-T3**	**Sliding crawl with right arm extended-T4**
1.	2010	F	6	4	4	5	5
2.	2009	F	7	5	5	4	4
3.	2009	M	7	5	4	4	5
4.	2009	M	7	2	3	3	3
5.	2010	F	6	4	4	4	5
6.	2009	F	7	5	5	5	5
7.	2009	M	7	4	5	5	4
8.	2009	M	7	4	4	3	4
9.	2010	F	6	5	5	4	5
10.	2010	M	6	3	3	4	3
ARITHMETIC MEAN			**6,6**	**4,1**	**4,2**	**4,1**	**4,3**
AMPLITUD			**1**	**3**	**2**	**2**	**2**
AVERAGE DEVIATION ABATEREA MEDIE			**0,04**	**-0,21**	**-0,12**	**-0,11**	**-0,13**
STANDARD DEVIATION			**0,48989795**	**0,94339811**	**0,748331477**	**0,7**	**0,781024968**
VARIABILITY COEFFICIENT			7,42269619	23,0097101	17,81741613	17,07317073	18,16337134

Tabel nr. 2. The results of the control samples of the **experimental group** conducted in deep water

THE EXPERIMENTAL GROUP (deep water)							
The subject of the research	**Year of birth**	**Sex M/F**	**Age (years)**	**Sliding crawl with push the wall-T1**	**Sliding crawl, crawl with legs exercise-T2**	**Sliding crawl, with left arm extended-T3**	**Sliding crawl with right arm extended-T4**
1.	2010	B	6	4	4	4	4
2.	2010	B	6	5	4	5	5
3.	2009	B	7	5	4	5	5
4.	2009	B	7	3	2	3	3
5.	2009	F	7	5	4	5	5
6.	2009	F	7	5	5	5	5
7.	2009	B	7	4	5	4	4
8.	2010	F	6	4	5	5	5
9.	2009	F	7	2	4	3	3
10.	2009	F	7	4	5	4	5
ARITHMETIC MEAN			**6,7**	**4,1**	**4,2**	**4,3**	**4,4**
AMPLITUDE			**1**	**3**	**3**	**2**	**2**
AVERAGE DEVIATION ABATEREA MEDIE			**0,03**	**-0,11**	**-0,22**	**-0,13**	**-0,14**
STANDARD DEVIATION			**0,458258**	**0,943398113**	**0,871779789**	**0,781024968**	**0,8**
VARIABILITY COEFFICIENT			**6,839665**	**23,00971008**	**20,75666164**	**18,16337134**	**18,18181818**

Tabel nr. 3. The results of the check samples of the **control group** conducted in shallow water

THE CONTROL GROUP (shallow water)							
The subject of the research	**Year of birth**	**Sex M/F**	**Age (years)**	**Sliding crawl with push the wall-T1**	**Sliding crawl, crawl with legs exercise-T2**	**Sliding crawl, with left arm extended-T3**	**Sliding crawl with right arm extended-T4**
1.	2010	F	6	4	5	4	4
2.	2009	F	7	4	4	5	4
3.	2009	B	7	5	5	4	4
4.	2009	B	7	3	3	3	3
5.	2010	F	6	5	4	5	4
6.	2009	F	7	5	5	5	4
7.	2009	B	7	4	4	4	4
8.	2009	B	7	4	4	4	4
9.	2010	F	6	5	5	5	5
10.	2010	B	6	3	3	3	3
ARITHMETIC MEAN			**6,6**	**4,2**	**4,2**	**4,2**	**3,9**
AMPLITUDE			**1**	**2**	**2**	**2**	**2**
AVERAGE DEVIATION ABATEREA MEDIE			**0,04**	**-0,12**	**-0,12**	**-0,12**	**-0,09**
STANDARD DEVIATION			**0,489898**	**0,748331477**	**0,74833148**	**0,74833148**	**0,53851648**
VARIABILITY COEFFICIENT			7,422696	17,81741613	17,8174161	17,8174161	13,8081149

Tabel nr. 4. The results of the check samples of the **experimental group** conducted in deep water

THE EXPERIMENTAL GROUP (deep water)							
The subject of the research	**Year of birth**	**Sex M/F**	**Age (years)**	**Sliding crawl with push the wall-T1**	**Sliding crawl, crawl with legs exercise-T2**	**Sliding crawl, with left arm extended-T3**	**Sliding crawl with right arm extended-T4**
1.	2010	B	6	4	5	4	4
2.	2010	B	6	5	5	5	5
3.	2009	B	7	5	5	5	5
4.	2009	B	7	3	2	3	3
5.	2009	F	7	4	4	5	4
6.	2009	F	7	4	4	5	5
7.	2009	B	7	5	5	5	5
8.	2010	F	6	5	5	5	5
9.	2009	F	7	3	4	3	3
10.	2009	F	7	4	5	5	4
ARITHMETIC MEAN			**6,7**	**4,2**	**4,4**	**4,5**	**4,3**
AMPLITUDE			**1**	**2**	**3**	**2**	**2**
AVERAGE DEVIATION ABATEREA MEDIE			**0,03**	**-0,12**	**-0,24**	**-0,15**	**-0,13**
STANDARD DEVIATION			**0,458**	**0,748331477**	**0,91651514**	**0,806225775**	**0,781024968**
VARIABILITY COEFFICIENT			6,84	17,81741613	20,8298895	17,91612833	18,16337134

Following the arithmetic mean of the performed tests by the control group (in the blue column) and the experiment group (in the red column) in Tables 1 and 2 represented in Graph 1 (on the vertical axis there are the marks from 1 to 5 and on the horizontal axis the tests performed by the subjects from the experimental and control group), as well as the evolution of the arithmetic mean of the tests performed by the control group (in the blue column) and the experiment group (in the red column) from Tables 3 and 4 and represented in Graph 2 we may draw the conclusion that the two start-up methods are approximately equally effective with a minimum plus for the experiment group who developed their activity in the deep water pool.

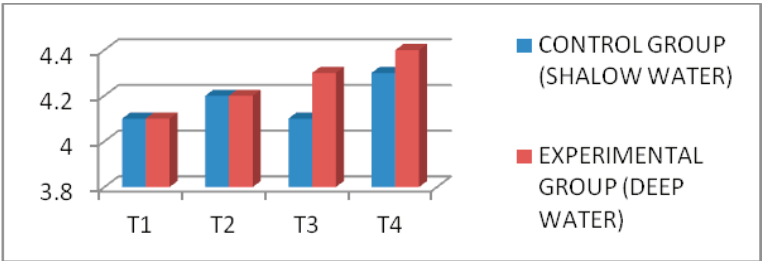

Chart no. 1. The graph represents the **arithmetic mean** of the samples from table 1 and 2.

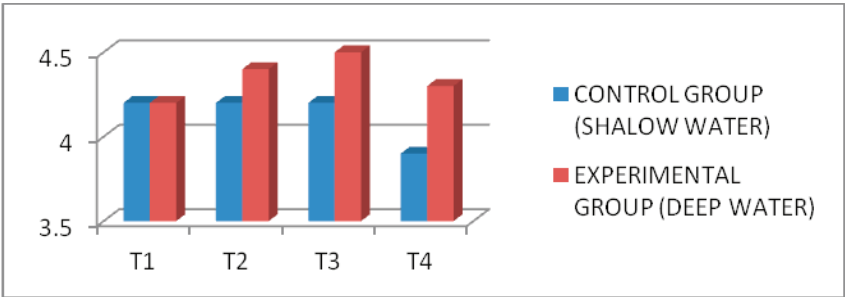

Chart no. 2. The graph represents the **arithmetic mean** of the samples from Table 3 of and 4.

Hence, I may conclude that after acquiring the basic technical elements (floating, breath, gliding), both the subjects from the control and experiment group learned and reinforced the front crawl and backstroke in about the same time, as I have previously stated, with a plus for the experiment group. Also, I appreciate that the means for the technical preparation have been sensibly chosen and used.

The most frequent age in the tested group was 7. The average age of the subjects in the tested sample was 6,6 for the experiment in shallow water and 6,7 years of age for those in deep water.

The variation coefficient (VC) is the most and significant indicator for the variation analysis. The VC of the age of the subjects who got marks is comprised between 0 and 10% which shows that the homogeneity of the group is high. The VC of the marks the subjects got at all tasks (both in shallow and deep water) is between 10 and 20% which shows the average homogeneity of the given marks. There is a deviation of the given marks from the central value with ± 0, 24, a difference that inscribes in the standard computed for the studied groups.

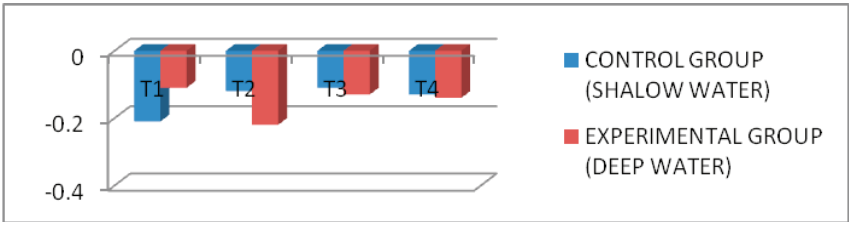

Chart no. 3. The graph representing the **standard deviation** of the samples from table 1 and 2.

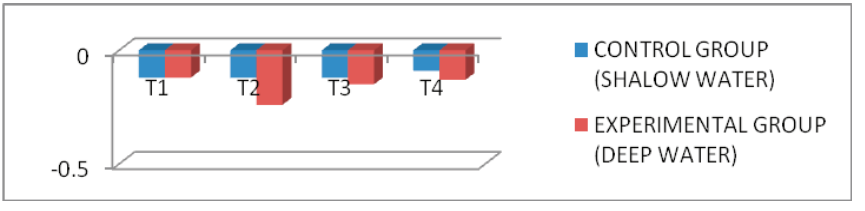

Chart no. 4. The graph representing the **standard deviation** of the samples from Table 3 of and 4.

Conclusions

Following the recorded data that have been statistically processed we may state that:

- the results at the performed tests improved constantly and finally the progress was obvious;

- the evaluation of the technique, though more difficult to achieve but based on a rigorous algorithm in our case showed an improvement of the basic technical skills, fact that proves that the independent variables have been rationally chosen.

I consider that the focus on the technical component of the training, especially at this age, when the psychological and physiological particularities of the subjects allow motion acquisitions, high receptivity, plasticity of the nervous system is of great importance and this is also noticeable in the progress made in acquiring the swimming basic technical elements and the front crawl and backstroke procedures (in gliding). The rigorous quantification of the technique influence and the obtaining of the sport performance is difficult to achieve but referring to the literature in the field we consider that at that age the effectiveness of the means used during the start-up stage, the learning of the basic technical elements and the swimming technique for front crawl and backstroke should be a priority over the physical, tactical and psychological training. The results obtained both with regard to the motion and technical accuracy acquired in shallow water pools confirm the hypothesis. Finally, I consider that the means used during the initiation stage and the technical preparation for learning how to swim front crawl and backstroke have attained their goal. Also, my future intention is to rationalize them and choose those with the highest formative value. As a general conclusion, I consider that the initiation of swimming in deep water pools is recommendable because after this stage children will be prepared for a new level of learning, namely that of other swimming technical procedures. The start-up stage for swimming in shallow water pools is recommended to the children between 1 and 5 years of age.

References

1. Jivan Ioan Sebastian, 1999, *Inot – tratat metodic*, Editura Printech Bucuresti, p. 87;

2. Luciela Carla, 1999, *Inot aptitudinile psihomotrice si pregatirea tehnica,* Editura Printech, p. 113;

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