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Original article

THE INCREASE OF THE DEVELOPMENT INDICES OF THE REACTION SPEED, USING SPECIFIC MEANS OF THE HANDBALL GAME (VIIth grade)

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Abstract*

Aim. The paper shows that by using the specific means for the handball game we can improve the reaction speed development indices, during the physical education lesson.

The research' hypothesis was centered upon the fact that the efficient use of the specific means for the handball game may lead in turn to an increase of the reaction speed development indices.

The objective of this research was both to verify and show that the specific means for the handball game may lead in turn to an improvement of the development indices for the reaction speed.

Methods. The methods we used were the observation method, the experimental method, the mathematical method of statistics and the graphical method.

Results. The research results revealed the fact that the development indices of the reaction speed may be improved using the specific means for the handball game. An increase from 8.2 s to 7.98 s for the first test was recorded, and for the second one an increase from 4.8 to 7.98.

Conclusions. We may say that on the score of our demarche, some significant increases for the development indices of the reaction speed may be achieved using the specific means for the handball game, during the physical education lesson.

Key words: increase, reaction speed, specific, handball.

Introduction

The physical exercises have appeared, developed and got better continuously, in relation to the social command, their emerging, developing and evolution being obviously conditioned by social factors. Contrary to some theories, the emerging, developing and evolution of physical exercises were determined not only by the material aspects of the social life, but also by some other factors, like science, culture level, religion etc. The whole development and evolution of practising physical exercises shows that this "was an activity continuously oriented towards perfecting human physical development indices and, simultaneously, those of the moving capacity" (Șiclovan, 1972, pg. 7).

Thus, the scientific substantiation has critically taken over, gave value to some ideas, norms, rules that also belonged to Antiquity, Renaissance, to the Human Bourgeois, and to some other social structures. This substantiation got head once "theory" and, "methodics" appeared, as scientific discipline, as well as other disciplines that approached our activity field from different angles and points of view.

The physical education essence lies in the fact that practising physical exercises aims all the time at the physical development, no matter the organizational form or the social, economical or political background where the improvement of physical development and the subjects motrical capacity occurs.

In other words, "the goals of practising physical exercises were relatively different from one socioeconomic and political context to another, but the essence remained always the same" (Curs M.E.F.S., 1997, pg. 2).

The physical education has a biological prevailing type, as well as very important implications in the social and cultural education areas.

Through its different and various forms of organization and due to its emotional dimension, the physical education brings a very important contribution in developing the ingeniousness, the affirming spirit, the desire for self-improvement, the aesthetic sense, the love for the motrical gesture, magnificently performed.

"The Physical Education and Sport constitute an independent branch of contemporary

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sciences and its object of research is the human in movement, under all circumstances, having as a final goal the contribution, together with other sciences, to the defending and perfecting the human being in order to increase its social efficiency” (Birjega, Bucur, 1972, pg. 13).

Most specialists state that during this present stage of physical education science evolution and developing, it's necessary to look for all the ways in which practising physical exercises may answer more and more adequately to the social commands given by the complex instructional and educational process of human personality multilateral forming.

As a instructional and educational process, it constitutes a social activity, deliberately conceived and displayed in order of perfecting the physical development and motrical capacity of those who practise physical exercises, depending on the age and sex characteristics, the social integration requirements, the peculiarities of a certain job etc.,.

By definition, functions represent some constant destinations of a certain phenomenon and derive from an ideal, meaning that they are its subordinates. The physical education ideal is achieved by functions. All physical education functions are extremely important and they prove their efficiency only if they are carried out, “into the system”, influencing and completing each other.

The physical education functions, divided into specific functions and associated functions, aim at the two directions belonging to the study object which is specific to Theory and Methodics, namely the physical developing and the motrical capacity. The associated functions fill the effects of practising physical exercises on human body.

The physical education main functions are that of perfecting the physical development, it's role being a priority especially when speaking of the young generation physical education and the motrical capacity perfecting function through which we aim at the two elements composing the motrical capacity, namely the motrical qualities, the motrical customs and the motrical skills.

The physical education objectives derive from its specific and associated functions and it subordinates to them. We may classify these objectives into training objectives and educational objectives.

The general objectives that have to be accomplished by teaching physical education in school, are:

-strengthening the pupils health and increasing the body general endurance capacity;

-stimulating the growth process and assuring a harmonious development in the sense of perfecting the functional somatic indices and preventing defective physical attitudes;

-developing the basic motrical capacities;

-forming the basic motrical customs and skills, utility applied and specific for some sports branches;

-forming the capacity and the habit of systematically practising the physical exercises, especially in the free time;

-initiating and practising some tests and sports branches;

-developing some qualities and some moral and volitional traits, as well as some intellectual ones, the aesthetic sense and social responsibilities.

Handball in school – the handball game is a discipline that was permanently included in the pre-academic and academic education plans.

It's accessibility, as well as the broad practice area on all the continents made possible for the handball to be included in the school curricula in almost all the countries in the world. The handball game is also, “an important mean of the physical education, that, practised under a competent guidance, develops qualities of the will (resoluteness, fight, courage, initiative, perseverance), as well as moral qualities like the respect towards the opponent, the referee, the team members, the conscious discipline, etc.” (Ghermănescu, 1982, pg. 11).

It is a sports game, where the manoeuvring of the ball is made by the hand, a fact that gets both the children and the youngsters not to use an abrupt attitude towards the opponents and, as a performance sport imposes the young players to work hard in order to cope with all the training requirements.

Its characteristics recommend handball as the first sports game that has to be included in the school curricula for the following reasons:

-is much more approachable than other sports games;

-it can be practised in and with minimal and easy to assure material conditions;

-the training process can run its course even if the weather is cold;

-it offers the possibility of transferring some content categories towards another sports game which can start in the superior curricula cycle.

Another objective of the learning teaching process and evaluation for this discipline is constituted by learning all the elements and technical game procedures, congruent with the practical application of the Game Regulation stipulations, having in mind the logical, the rational, and the



learning units, in order for the students to fully practise the game, at the end of the VIIth grade.

We have to pay much attention to children's first contact period with the handball game, because it's very important for their evolution, their attitudes and subsequent options in practising this game.

Thus, we have to consider the children's joy of playing this game, but also the physical education objectives for this age. Here, we distinguish two ways of practising the handball game:

- during the physical education class;
- in the clubs or sports institutions

departments, specialized for performance handball.

During the initiation stage, it is very important to lay stress on the game itself, for the boys as well as for the girls. We speak of dynamic exercises based on race and achieving the socio-affective objectives. This means that the improving of motrical experience, the education of general motricity and especially coordination, are as important as forming specific handball game behaviours, as the team spirit, the fair play.

The motrical qualities represent body capacities, taking shape in the ability to perform movement actions, with certain speed indices, force and skill. In the same time, "they action, with a much greater efficiency, through a deliberate system of specific means in order to develop each motrical capacity" (Firea, 1979, pg. 151). In specialty terminology, these capacities or capabilities are also called physical qualities, motrical or biometrical qualities or motrical capacities.

Any movement of the human body, no matter how complex, is characterized by "the essence of four basic elements: force, speed, endurance and skill. We are thus entitled to designate these qualities as being ones elementary to all movements and call them basic qualities" (Birjega, Bucur, 1972, pg. 51).

Speed - from the mechanical point of view speed can be defined as the space covered in a unit of time, "the speed is the result of a force acting on a mass. According to the way it is acted, it can be either uniform or uneven; movement acceleration and deceleration are specific to the human body performing movements. These two don't exclude the keeping of a normal working rhythm. The executants ability to maintain an optimal execution speed (the maximum speed doesn't always assure success) is called speed sense, correlated, to a large extent, to the sense of rhythm and tempo" (Dragnea, Bota, 1999, pag. 225).

The speed is defined as being, "the capacity of making a movement or a suite of movements as nfast as possible", being considered a, "less

perfectible" ability (Rață, 2008, pag.113). From all the psycho-motrical abilities, "speed is considered as being mainly influenced by hereditary factors. However, this fact doesn't admit the idea it is impossible for it to be educated. The increase of speed needs a constant action on the perfectible factors, even on the less perfectible ones, but also on developing the level of the other skills, especially of the force and coordination" (Rață, 2006, pag. 114).

The speed is also defined as being, "the human body capacity of making acts and motrical actions, using the whole body or only certain segments (parts) of it, as fast as possible, i.e with maximum rapidity (quickness, speed), according to the existing conditions" (Cârstea, G., 1993, pag. 46), or "by the capacity of making the motrical actions in a minimum amount of time for the given conditions" (Zațiorski, quoted by Mitra, Mogoș, 1977, pag. 53).

The reaction speed or the latency stage, 'refers to the capacity of respoding as fast as possible to a certain stimulus. It is measured in m/s, by calculating the time has elapsed from the stimulus appearance till the beginning of the response movement.

A very important fact is that "the speed is mainly related to the information processing speed. Thus, a new form of speed emerges, namely the decision speed, which shows itself in correlation to the anticipation capacity and the reaction speed" (Rață, 2008, pag. 115).

In 1985 Șiclovan stated that, "the reaction speed represents the capacity of responding as soon as possible to a certain stimulus; it is measured by calculating the time elapsed since the stimulus appeared till the movement was made" (Șiclovan, 1985, pag. 150).

"The motrical reaction speed (Ozolin, Florescu) or the latency time of the motrical reaction (Demeter) refers to the body capacity of responding to signals (stimulus, commands), to the rapidity with which it takes notice of and receives the signals and the necessary duration of beginning the action (elaborating and sending the response)" (Mitra, Mogoș, 1977, pag. 61).

In 2011, Cordun M. stated in his book called "Biomechanics and ergometry in Sports", that "the reaction speed is the simplified name, given by analogy of the reaction speed", representing "the amount of time (the motrical reaction latency) between the moment of detecting the signal release (visual stimulus, sound stimulus, cutaneous or proprioceptive) and the appearance of the self-willed appropriate motive answer.



The reaction time has different values, depending on the type of the trigger signal, which can be simple, unique (a sound stimulus), and complex, on the training level or on the type of the requested motrical reaction, which can also be simple (unique), consisting of known responses to known stimuli and complex (multiple), when the motrical responses have to be chosen from multiple possible variants appeared in new, unforeseeable situations, like those which occur in the sports games.

As a conclusion to the facts we stated above, but also from our experience in this field area, we may assert that the reaction speed has a great importance not only during the PE lesson but also in the motrical acts performed by individuals in everyday life.

Methods

The experiment took place at the School Group "Anghel Saligny", I-XII grades, Brăila,

Results

Table no1 – The results recorded at the initial and final tests at the two suggested tests and the registered progress

No subject	Test 1 (sec.)		Test 2 (nr. de reușite)	
	Ti	Tf	Ti	Tf
S1	8.2	7.8	3	5
S2	8.3	8.1	6	7
S3	8.1	7.8	5	7
S4	7.9	7.9	4	6
S5	8.4	8.1	6	8
S6	8.2	8.0	3	6
S7	8.0	7.9	5	7
S8	8.5	8.2	7	7
S9	8.1	7.9	4	6
S10	8.3	8.1	5	6
Sum (Σ)	82	79.8	48	65
Arithmetic mean (X)	8.2	7.98	4.8	6.5
Progress (P)	-0.22s		+1.7reușite	

Legend: Ti/f = initial/final test S1-10 = subjects from 1 to 10

From table no1. results that, on the score of the demarche we used, at the first test, which consisted of leaving for counter-attack with the back to the movement direction, the registered progress was of -0.22 seconds.

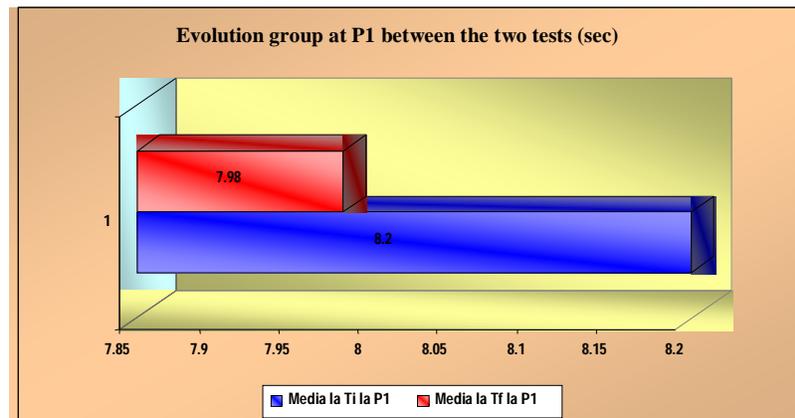
between 1st of October 2015-30th of May 2016, on a sample of ten pupils from the VIIth grade (boys). These were the tests we suggested for evaluating the efficacy of the used demarche:

Test1 (P1) – standing with their backs to the movement direction, at 1m distance from the goal line, at the 6m semicircle, leaving for the counter-attack, when hearing the sound signal. We will time the time elapsed from the sound signal moment, till reaching the 9m semicircle from the other half of the handball court.

Test 2 (P2) – from the lying face down position, with their legs headed towards the "goal", the extremities touching a line, traced at 6m from a wall, on which a circle is drawn ("the goal"), having its centre at 1.5m from the ground and a 2m diameter, at the sound signal standing up and throwing at the circle (10 throws in 30 seconds).

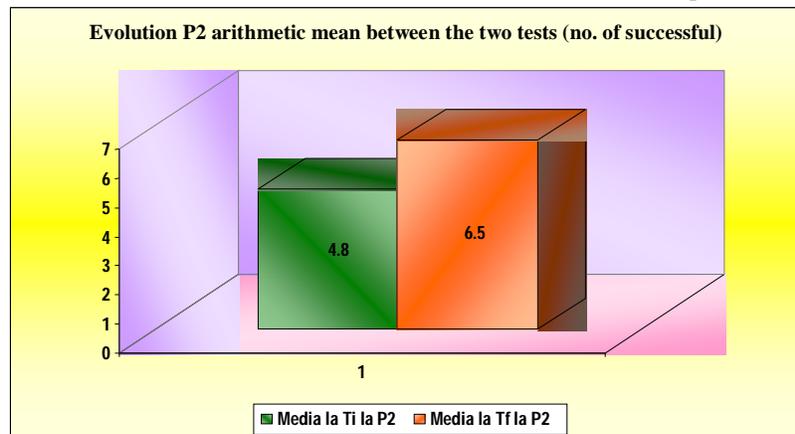
For the second test, that consisted of "throwing the goal" lying face down, at the sound signal, was registered a progress of +1,7 successful results. This shows us that the demarche we used was efficient.

Graphic no. 1



From graph no.1 it is clear that the group evolution for the first test is significantly enough, the progress being of $-0.22s$.

Graphic no. 2



From graph no.2 it is clear what was the group evolution between testings, the progress we registered being of $+1.7$ successful results.

Discussions

The studies that approached this subject made it from other angles, like Saul Sternberg (saul@psych.upenn.edu) Revised, as of March 20, 2010 and „A Literature Review on Reaction Time” by Kosinski from Clemson University in 2008, but all these studies do nothing but enrich our activity field.

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Conclusions

We may say that on the score of our demarche, some significant increases for the

development indices of the reaction speed may be achieved using the specific means for the handball game, during the physical education lesson.

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