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THE IMPROVEMENT OF THE MOTOR QUALITY - SPEED WITH SPECIFIC MEANS FROM FOOTBALL IN THE PHYSICAL EDUCATION LESSON FOR STUDENTS OF SECONDARY SCHOOL

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ABSTRACT. The objectives of this study target ways to make the physical education lesson more efficient with a many-sided development, with a better environment, and, at the same time to reach the goals from the curriculum. For having true and relevant results there were used approved tests like 30 m sprint and 5x10 m shuttle. In order to have the best precision when measuring the results, it was used the Linggate Encoder (MicroGate). At the initial test it was determined that neither of the two groups of subjects is very different. The two groups have a good homogeneity. After the intervention on the two groups it was started to have real differences and modifications. The conclusions of the study shower us, one again that a many-sided training and the game type exercises grow the students' motivation, the efficiency of the lesson and helps getting new and better results.

Key words: *skills, methods, means, results, evaluation*

REZUMAT. Îmbunătățirea calității motrice - viteza prin mijloce specifice din fotbal în lecția de educație fizică pentru copii. Obiectivele acestui studiu vizează modalități de a face lecția de educație fizică mai eficientă, cu o dezvoltare multilaterală, cu un mediu mai bun și, în același timp, să atingă obiectivele din curriculum. Pentru a avea rezultate reale și relevante au fost utilizate teste aprobate cum ar fi 30 m alergare de viteză și naveta 5x10 m . Pentru a avea cea mai bună precizie la măsurarea rezultatelor, a fost utilizat Linggate Encoder (MicroGate). La testul inițial sa stabilit că nici unul dintre cele două grupuri de subiecți nu este foarte diferit. Cele două grupuri au o omogenitate bună. După intervenția asupra celor două grupuri a început să aibă diferențe și modificări reale. Concluziile studiului ne oferă din nou, că o formare

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multi-laterală şi exerciţiile de tip joc măresc motivaţia studenţilor, eficienţa lecţiei şi ajută la obţinerea unor rezultate noi şi mai bune.

Cuvinte cheie: abilităţi, metode, mijloace, rezultate, evaluare

Introduction

The changes that the Romanian education proposes are really important and one of the most important things that this kind of education is switching from the informative education to the formative education. In physical education and sport this applies as a reconstruction of the methods of teaching and the forms of the teaching process.

The motor quality – speed is conditioned by several factors, such as: physiological factors, biochemical factors, psychic factors but also morphological factors.

Physiological factor. Important in determining speed is the mobility of cortical nerve processes, and the quick alternation in the cortical center of the execution and inhibition. This mobility of the nerve processes is innate and hereditary and it can be perfected subsequently. The muscle excitability and responsiveness are also factors which condition the speed of moves.

Daneshjhoo et al. (2015) found greater knee adduction in non-dominant leg rather than dominant leg, which suggests the existence of bilateral different knee valgus joint angle. Usually, the non-dominant leg provides postural support while the dominant leg is used to kick the ball. In players with asymmetric kinetic patterns, more emphasis is given to one side of the legs which negatively influence muscle balance. Football players almost never use both legs with equal emphasis. Their preference to use one side more than the other is related to hemispheric dominance of the brain in the opposite side. This is the possible cause for this result in professional soccer players.

Marques et al. (2013) concluded in their study that a short 6-week period of combined sprint and plyometric training can significantly improve explosive strength in youth competitive soccer players, and, more importantly, that this improvement can be transferred to soccer kicking performance in terms of ball velocity.

In determining the speed, what's really important, is the transmission speed of the nerve impulse and this is conditioned by the time of transmission of the impulse by the central nervous system, the time of transmission of the impulse to the muscles, the time needed to make the organs move. The concentration capacity helps to keep a constant speed. (Demeter, A., 1982)

Hader et al. (2015) has shown that change of direction (COD)-sprints are largely less metabolically demanding than linear sprints. This may be related to the very low metabolic demand associated with the deceleration phase during COD-sprints that may not be compensated by the increased requirement of the reacceleration phase. These results also highlight the dissociation between metabolic and muscle activity demands during COD-sprints, which questions the use of metabolic power as a single measure of running load in football.

Loturco et al. (2016) in his study support adopting the jump squat exercise to the detriment of the Olympic push press in soccer players, due to its superior transference effects on sprinting over short (5 m) and long (30 m) distances. The use of jump squat could be a safe strategy for increasing speed ability in soccer players, without the inherent risks involved in maximal sprint training (e.g., hamstring injuries).

The morphological factor. Until recently, in the specialists' eyes, the best body type for fast movements was considered to be the body type with long legs. But in time, with all the research it was revealed that this factor has a small influence.

Usually the sprint contest is won by sportsmen who are really different in the means of morphological issues. Zibung et al. (2016) concluded that motor tests play a key role in talent selection in football and this is a viable means of forecasting performance in the age range of 12–15 years.

The psychic factor. A very important factor for sprinters is the capacity of their will. If they are really willing to win, they will do it. This aspect can be improved.

The biochemical factor. As we all know, the muscle has two types of fibers – red and whites. The white fibers are fast and the red ones are slower, but we have the mixt type too. For the speed we need more white fibers because they contain lots of myofibrils required for a contraction and because they are high in adenosine triphosphate phosphocreatine (ATP) and glycogen.

These substances, ATP and CP are considered macro-energetic, because when they decompose they eliminate energy.

Usually the sportsmen in this field have 80-90 % white fibers in their muscle. We are born with different muscle structure. Now, the question is, if the speed training helps to change the red fibers into white fibers? The results are partially positive, especially to those who train super maximal themselves for a long time. (Demeter, A., 1982)

For an efficient way of developing the speed, the velocity in all its sides, it is recommended to use the competition as a way of training and to enlarge the numbers of reps. You have to be attentive to having long enough rest time between reps. In these rest times, the body has to fully recover.

Haugen et al. (2015) proved that neither weekly sprint training at 90 or 100% velocity, nor supervised sprint training enhanced soccer-specific physical performance in junior soccer players.

In schools, in the last years, the motor qualities became really important. Almost each and every physical education and sports lesson has something to do with the speed.

The assumptions of the research

Starting with the premises shown already, the following assumption is considered: optimizing the lessons of physical education respecting the curriculum, in terms of the dynamics and complexity of the effort along a learning unit.

The research task was to set the tests and measurements, which give an overview on the students' level of athletic training, of learning the sprint running and of the somatic development.

There is the possibility of improving the speed in the physical education lessons, in specific conditions borrowed from football. By proper systematization of the main means that act on the development of speed, the possibilities of a good result are increasing.

Theoretical data of the experiment

After setting up the group of subjects, the ethical and research agreement within the education unit were received. The next step after the subjects' randomization was the initial testing for all subjects. Next, in order to develop the speed, the analytical means were used upon the control group and the football specific means were used upon the experimental group.

And so, the research ended up with the final testing where all the subjects had to repeat the tests used in the incipient phase of the research.

The tests are:

1. 30 m sprint

Objective: the evaluation of the travel speed.

Test description: When the teacher says, on your marks the students come near the white line of the field. After the whistle blows, they start running to the other white line, they have to take with them a piece of wood and bring it back to the start line, after they putted down the piece of wood they have to run again to take the second piece of wood too.

Materials: stopwatch, 2 cones, the wood pieces, and 2 lines on the field.

Application: The test runs on the synthetic ground, enough space to make the stop will be provided. The ground is straight and is marked with two white lines.

Indications: The stopwatch in on only when the student starts running and it stops when the chest of the subject crosses the finish line. For those who have a better time than the equivalent of 100 points it is added an extra 2 points for each tenth in minus.

2. 5x10 m shuttle

Objective: Investigation of speed-coordination quality.

Test description: 5x10 meters with full speed.

Materials: clean surface, stopwatch, chalk, cones.

Application: The subject is behind the white line, ready to go. When the teacher blows the whistle, he starts to run as fast as he can till the next line which is at 10 meters distance. The subjects have to cross the line with both feet. They have to repeat this road 5 times. Only one time is allowed this test, they cannot repeat it.

Indications:

- the two lines on the ground should be 1,20 m long,
- boarders should be marked with cones,
- at every tour the number of the tour will be said loud enough,
- the stopwatch is stopped when the subject, after the 5^{th} cycle crosses the line with foot.
- the recording of the time is made in tenth of seconds,
- example: A time of 21,6 seconds is 216 points.

The speed recording is made with a sort of a new technology. The technology has arrived to great standards and so, for recording times we have radio impulses. The possibility to loose data, to not being able to have exact results is buried away with these new types of technologies.

The LINKGATE ENCODER represents a new and innovating system for recording times. The tech evolution led us to advance from the old type of impulse to a new and modern type which gives us the maximum accuracy in transmitting large quantities of information.

The compact way and because it can be used with VHR and UHF radio transmitter makes LINKGATE ENCODER an ideal program for all kind of competitions.

Time and place of the research

This research was started in 14th of September 2016 and it ended in the 12th of October 2017. The author is a physical education teacher at the Elementary School of Chinteni, Cluj County.

The subjects are the students from the 8th grade at the Chinteni Elementary School.

Table 1. Subjects – Control group

Subject No.	Gender	Height	Weight
1	F	164 CM	48 KG
2	F	160 CM	55 KG
3	M	159 CM	60 KG
4	M	158 CM	51 KG
5	M	155 CM	54 KG
6	M	160 CM	52 KG
7	M	158 CM	52 KG
8	M	163 CM	59 KG

Table 2. Subjects – Experimental group

Subject No.	Gender	Height	Weight
1	F	158 CM	42 KG
2	F	158 CM	50 KG
3	M	174 CM	69 KG
4	M	166 CM	60 KG
5	M	165 CM	57 KG
6	M	160 CM	55 KG
7	M	164 CM	58 KG
8	M	166 CM	57 KG

Results

Data presentation

Initial test – control group

Table 3. Initial test – control group

Subject No.	Gender	Speed 30 m / sec	Shuttle 10X5M/sec
1	F	5.3	24.4
2	F	5.4	22.5
3	M	4.9	21.8
4	M	5.0	24.2
5	M	5.1	23.4
6	M	4.9	23.4
7	M	5.2	21.9
8	M	4.6	22.3
	Mean value	5	22.9

Initial test - Experimental group

Tabel 4. Initial test - Experimental group

Subject No.	Gender	Speed 30 m / sec	Shuttle 10X5M/sec
1	F	5.0	23.7
2	F	5.3	23.8
3	M	5.1	20.8
4	M	4.9	24.6
5	M	4.5	20.9
6	M	5.1	23.2
7	M	5.0	23.5
8	M	4.9	24.0
	Mean value	4.9	23.06

Final test - Control group

Table 5. Final test – control group

Subject No.	Gender	Speed 30 m / sec	Shuttle 10X5M/sec
1	F	4.7	23.1
2	F	4.9	21.8
3	M	4.7	19.8
4	M	4.8	22.6
5	M	4.7	21.9
6	M	4.9	22.2
7	M	4.9	20.3
8	M	4.3	22.3
	Mean value	4.7	21.7

Final test - Experimental group

Table 6. Final test - Experimental group

No.	Gender	Speed 30 m / sec	Shuttle 10X5M/sec
1	F	4.1	21.1
2	F	4.6	20.8
3	M	4.7	19.8
4	M	4.4	20.6
5	M	3.9	18.9
6	M	4.5	21.2
7	M	4.6	21.3
8	M	3.9	20.3
	Mean value	4.3	20.5

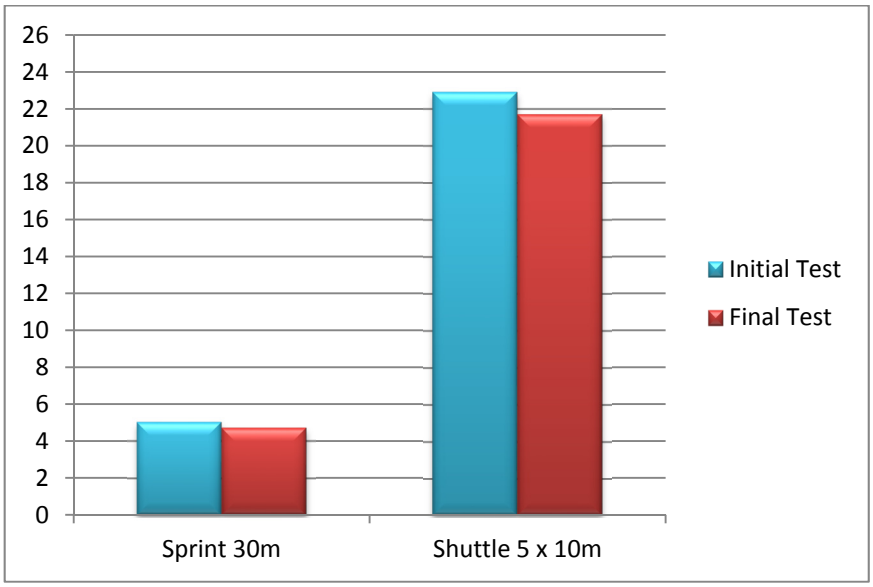

Figure 1. Comparison of the results – Control group

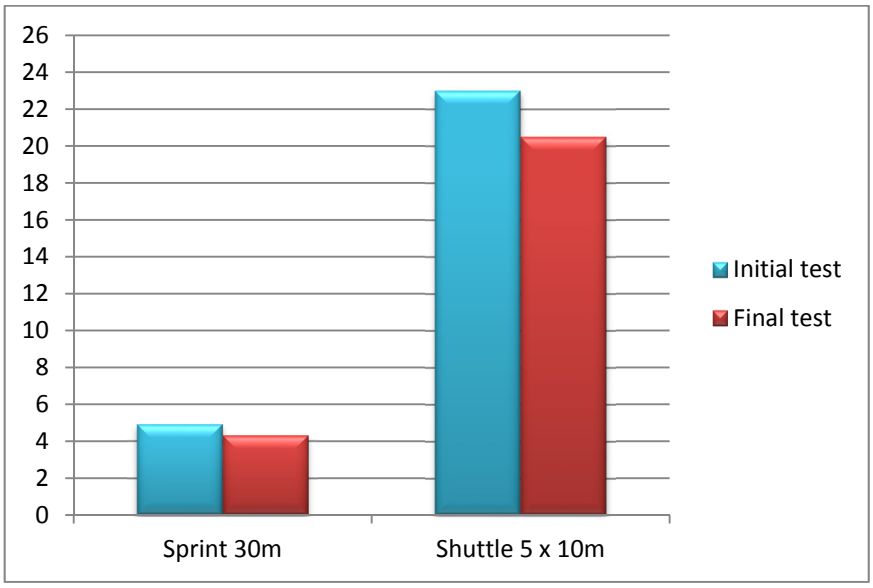

Figure 2. Comparison of the results – Experimental group

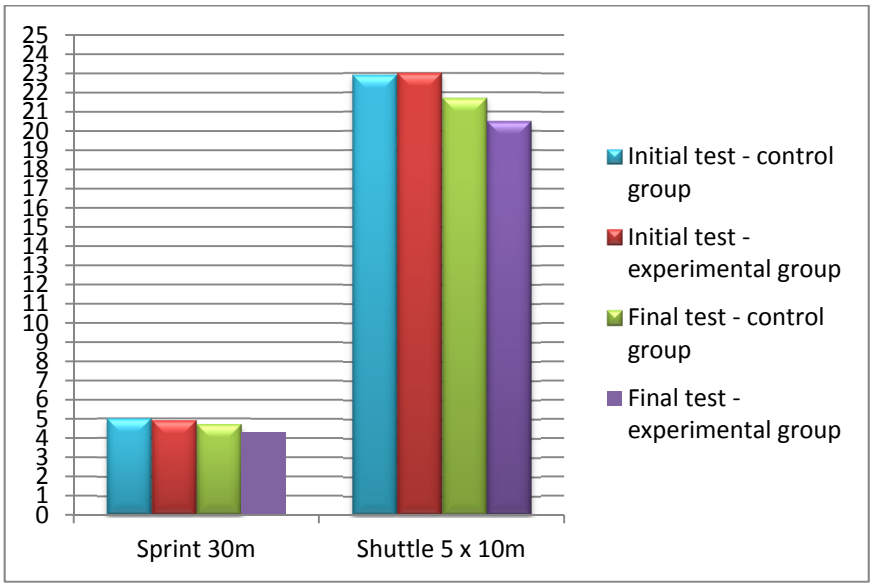

Figure 3. Comparison of the results for both groups – Initial and Final tests

Conclusion

The results give an answer to the questions from the begging of this paper. By using the specific means from football it was possible to see a good improvement in the development of the speed.

The results show that at this age velocity can be influenced.

The development of speed by new means doesn't harm in any way the physical training; by contrary this new means can be useful in the future, when the complexity of the movements grows. For the physical training in school it is very important to choose the right means and the right methods.

By using means as interesting as possible we can attract the students to come closer to our field, to physical education. If the students show a real interest in these kinds of activities, the training time interval or the complexity of the exercises can be increased in order to have a bigger progress.

The means have to be adapted to their possibilities, and teachers have to keep in mind the following aspects:

- the individual effort capacity,
- their age,
- their gender.

The best way to see each student during his activity is to use means which allow the teacher to see them individually. For this to happen, one can put them in smaller teams, or to make them work in pairs or individually. In all these cases to correct them is much easier.

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