



## Discussions

The result of the Sargent Test for determining the maximum anaerobic-alactacid power is:

*The Experimental Group*, at the final testing, registers a gain in power of 5,01% (6,1 kg/s) in comparison with the initial testing. One student modified his grade from weak to satisfactory.

*The Control Group*, at the final testing, registers a gain in power of 0,72% (0,85 kg/sec) in comparison with the initial testing. One student modified his grade from satisfactory to weak.

In terms of the coefficient of variation, all the groups have a high homogeneity both in the initial test and final testing. Similar studies have been addressed by Bocioaca, 2003 and Vaida, 2011.

## Conclusions

➤ At the Sargent test which evaluates the maximum anaerobic-alactacid power, the biggest progress were made by the experimental group, and for the control group the progress was insignificant. On a whole, it can be appreciated that regarding the anaerobic-alactacid capacity of the subjects, there still is the possibility of improvement in a significant quantity through the use of plyometric exercises, which concludes to the fact that the functional reserves of young people are insufficiently explored.

➤ Following this research, the obtained results demonstrate that the plyometric method used during the physical training produces significant swing growth, the subjects of the experimental group having significant diminished values at the end of the training program.

➤ Strength training is essential for jumpers and sprinters as body weight (during the beat movement with vertical separation) and body mass provide a very high resistance.

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## STUDY ON THE INFLUENCE OF SPORTS GAMES` IN THE DEVELOPMENT OF THE MOTRIC CAPACITIES

DEACU MARCEL<sup>1</sup>

### Abstract

*Purpose.* Sporting games are characterized by a complex manifestation of all driving capacities, and in training their development - in order of requirement for competition - must be the most important aspect. Considering the characteristics and the involvement of the games, especially the sporting games, and their influence on the formation and the development of the human personality, as well as the increasing number of students who choose to play them.

<sup>1</sup>Petroleum - Gas University Of Ploiești, ROMANIA  
Email: marceldeacu@yahoo.com



*Methods.* We chose that in our paper to refer to the methods of the sporting games and at how these influence the development of the combined driving capacities during the physical education classes at the Petroleum Gas University of Ploiești.

*Results.* The subject were subdues to the measurement of several driving tests consisting of force and speed, and in this paper we will present only the result of two tests: on-the-spot vertical jumps and from the spot horizontal jumps.

*Conclusions.* Following the statistical processing of the results, it was observed that at all the applied tests, the experimental groups were superior to the control group, the difference between the averages at the final test were significant. The methods of the sporting games can contribute to the improvement of the manifestation values of the conditioned capacities in the physical education and sporting classes.

*Key words:* sporting games, conditional capacities, tests, measurement

## Introduction

All sports programs must include fundamentals of training namely: physical, technical, tactical, physiological and theoretical. Physical training has an important role in the whole process of training, leading ultimately yield athletes in training and competitions. Physical training is one of the most important factors, and in some cases even constitute the starting point for the entire process of preparation.

Physical training encompasses a whole system (whole) measures ensure high functional capacity of the body, the high level of development of basic qualities biomotrice specific optimal values of morpho-functional indices, full mastery exercises used perfect condition health. Physical training is important at all levels of education, being different from one sport to another branch in relation to specific requests. Thus, groups of beginners, physical training has high share in saving time and resources used reported the preparation tactic, technique etc. Groups both beginners and professional athletes in physical training is the starting point and create the necessary foundation to address other components of training.

Specific physical training content is mainly focused effort to develop an industry specific sports and driving qualities combined and differentiated primarily involved, leading ultimately specific performance ". In some branches of sports performance is strictly limited by the development of motor skills (weightlifting, rowing) or a complex motor skills (sports, combat sports and so on). Specific physical preparation is done strictly specialized means developing quality combinations priority determined by the particular branches of sports, muscle groups involved in the effort, so such request (Dragnea, 1996).

Sports games include higher forms of motion and is conducted using combinations of already known and held in the form of driving skills, which improve motor skills specific form that can be optimal if the parameters driving qualities are high. By using complex media such as team sports in physical education lessons and sports training to move from quantity to quality with the increased efficiency and better able they produce motor speed to all participants.

Students practice sports games even if they are not endowed with exceptional skills required major competitions or creativity great athletes. They practice at the level where they are accessible and become what A. Dragnea calls "sport consumers". "Consumers sport is a direct beneficiary of sporting activities involved with practice and participate as knowledgeable sports show (Dragnea, 1981).

In sports training, seldom as one effort to dominate the movement, it is often the product or combination of at least two qualities. There are times when force and speed dominate equal strength to strength combination produces muscle endurance, strength and speed is the product of speed, strength, agility is a combination of speed, strength and coordination, agility with flexibility given mobility. The act (gesture) motor, motor skills influence each being in a relationship of interdependence, leading to so-called regime manifestation driving quality. Regime is the manifestation of a different driving qualities determined by the influence of one or other driving qualities, which first manifested simultaneously or integrative and functional couples are speed, strength, skill and endurance.

Strength and speed are in an inverse relationship: the higher the speed, the load used will have to decrease. Manifestation of maximum force in minimum time is known as the sport explosive force, a designation used by some experts and if under the speed force (Baroga, 1980).

The components of the motion capacity are dealt precisely for each category: conditional, intermediate and coordinative capacities, motion skills and abilities, attitudes and habits.

In this part we have also considered sport games as means of university physical training from their definition, history, characteristics, organization to their objectives, education principles and methods concerning the application of sport's games in the physical training course (Deacu, Finichiu, 2010).

Speed force under combined driving is a quality found in throwing, weightlifting, rugby, bobsleigh, gymnastics, the dominant power. "The power and absolute power is manifested in the game by flashing

feet (V-F) and the explosive force of arms (F-V) (Tudor, 1999).

Speed mode combined driving force is a quality that we find in all speed running, jumping and all sports games handball, football, volleyball, basketball, tennis, water polo, the acyclic sports: gymnastics, wrestling, fencing, climbing, boxing etc. (Colibaba-Evuleț, Bota 1998).

Considering the games' characteristics and implications, especially sport games, concerning the formation and development of the human being, and also the increasing number of students who choose to practice those games we have chosen in our work to refer to the most solicited sport games within physical training courses accomplished in the Petroleum-Gas University of Ploiesti, that is: basketball, football and handball.

#### The purpose of the research

The purpose of our research is to stress the efficiency of some sporting disciplines regarding the evolution of the conditional capacities, especially of those combine at the physical education classes with the students of the Petroleum Gas University of Ploiești. Through this approach we followed the identification of the obtained results following the use of the briefing programs and the operational structures suggested in the research, destined especially to the development of the combined driving qualities.

#### Hypothesis

If we used the methods from the sporting games in the physical education classes, then the improvement of the driving capacities of students would be possible

#### Tasks

➤ A complex and multidisciplinary documented awareness regarding the setting of the theoretical and methodical characteristics of the theme (Moanță, 2006);

➤ Establishing the work group regarding the testing of the operational didactic project;

➤ Establishing the level of development of the combined driving qualities of the subjects (initial testing);

#### Results

##### 1. Throwing the ball at oină (TBO)

**Table 1.** The values of the statistical indicators for TBO

Statistical parameters	Basketball		Football	
	I.T.	F.T.	I.T.	F.T.
Average	46,1	49	43,9	45,6
Standard deviation	6,59	6,29	9,62	9,64
Median	46	49,5	42,5	44,5
Minimum	36	39	27	28,5
Maximum	58	61	63	64
Amplitude	22	22	36	35,5

➤ Making the verification experiment;

➤ Fixing the level of development of the combined driving qualities of the subjects (final testing);

#### Research methods

➤ The analytical method – the study of the documents;

➤ The descriptive method: the observation;

➤ The experimental method;

➤ The evaluation and measuring methods

For force measurement under speed (explosive force) present the following tests ( Tudor, 2005)

:

1. Running speed of 30m to start standing trial in which subjects were run individually.

2. Throwing the ball rounders place. Throwing away the ball rounders preferred arm, the place, the foot opposite throwing arm was attached to the line of demarcation, the body placed in the opposite side facing the throwing arm throw, throwing arm stretched backward. Run two throws, recorded the longest throw. Record length in meters disposal.

➤ The processing and interpretation methods: the grafical, statistical and logical methods.

#### The content of the experiment

➤ The experiment took place during the physical education classes with the students of the Petroleum Gas University of Ploiești.

➤ The Experimental group consisted in a group of students who chose the following sports: basketball, football and handball, and the Control group consisted in a group of students who chose classical physical education classes (general preparation classes).

➤ The subject were subdues to the measurement of several driving tests consisting of force and speed, and in this paper we will present only the result of two tests: on-the-spot vertical jumps and from the spot horizontal jumps.

➤ Processing the obtained data and drawing the conclusions from the experiment.

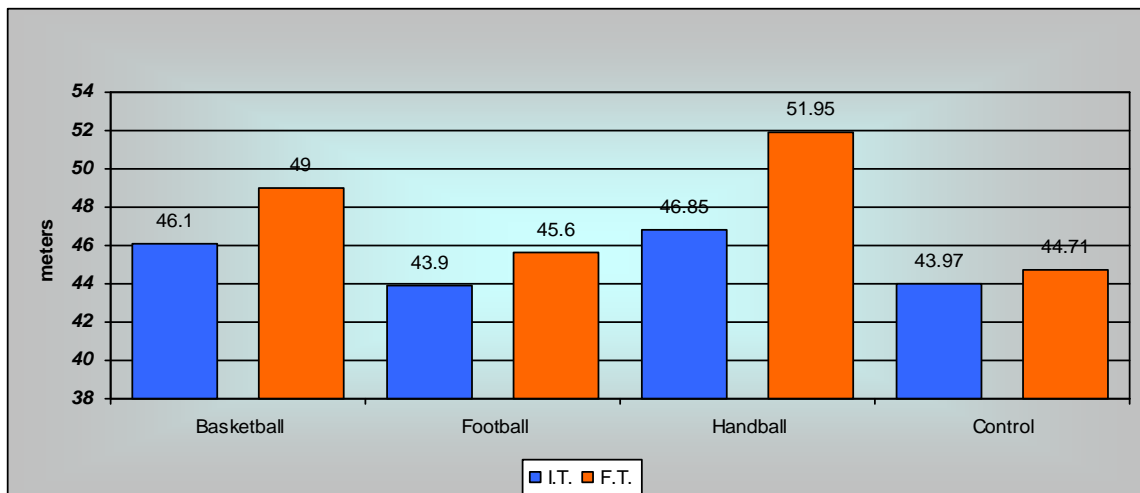
Variability coefficient	14,30	12,85	21,93	21,15
Standard error	1,47	1,40	2,159	2,15
The scatter	43,46	39,68	92,72	93,01
Trust level (95%)	3,08	2,94	4,50	4,51

**Table 2.** The values of the statistical indicators for TBO

Statistical parameters	Handball		Control	
	I.T.	F.T.	I.T.	F.T.
Average	46,85	51,95	43,97	44,71
Standard deviation	9,63	8,97	6,58	6,29
Median	46	53	45,5	46
Minimum	30	36	26	28
Maximum	65	67	61	61
Amplitude	35	31	35	33
Variability coefficient	20,55	17,27	14,96	14,07
Standard error	2,15	2,00	1,04	0,99
The scatter	92,76	80,57	43,30	39,61
Trust level (95%)	4,50	4,20	21,02	20,11

**Table 3.** Accomplished progress by each group for TBO (m)

Group	I.T.	F.T.	D = F.T.- I.T.	D <sub>F.T.-I.T.</sub> (%)
<b>Basketball</b>	46,1	49	2,9	6,29
<b>Football</b>	43,9	45,6	1,7	3,87
<b>Handball</b>	46,85	51,95	5,1	10,88
<b>Control</b>	43,97	44,71	0,74	1,68



**Figure 1.** Values of the arithmetical mean - TBO (m)IT, initial testing; FT, final testing; m, meters; Group of Basketball, Football, Handball, Control; TBO, Throwing the ball at oină .

## 2. The test 30m Running



**Table 4.** The values of the statistical indicators for 30m Running

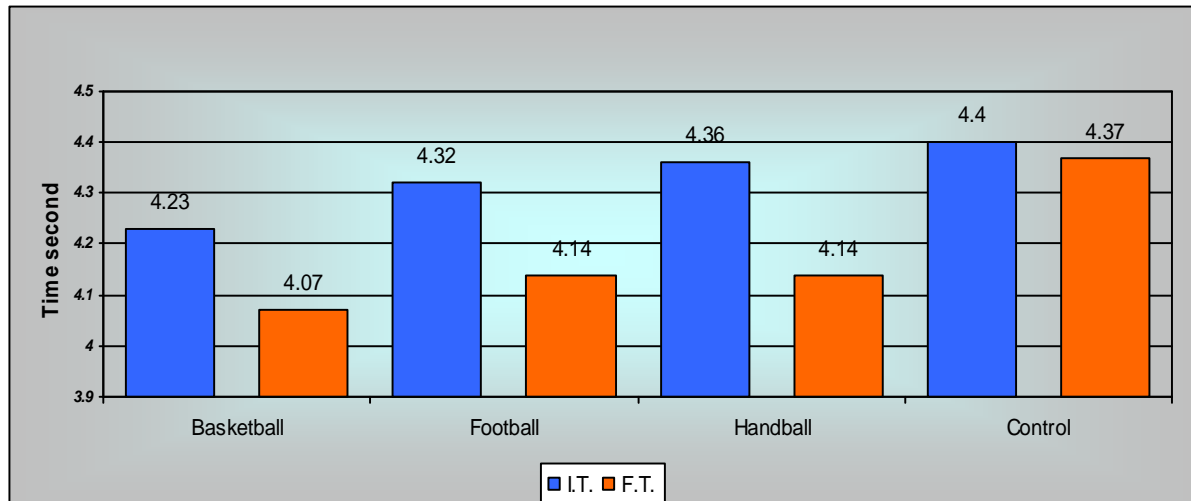
Statistical parameters	Basketball		Football	
	I.T.	F.T.	I.T.	F.T.
Average	4,23	4,07	4,32	4,14
Standard deviation	0,23	0,17	0,26	0,26
Median	4,29	4,12	4,29	4,04
Minimum	3,78	3,7	4,02	3,88
Maximum	4,64	4,28	5,19	5,01
Amplitude	0,86	0,58	1,17	1,13
Variability coefficient	5,52	4,38	6,19	6,37
Standard error	0,05	0,03	0,05	0,05
The scatter	0,05	0,03	0,07	0,06
Trust level (95%)	0,10	0,08	0,12	0,12

**Table 5.** The values of the statistical indicators for 30m Running

Statistical parameters	Handball		Control	
	I.T.	F.T.	I.T.	F.T.
Average	4,36	4,14	4,40	4,37
Standard deviation	0,26	0,25	0,22	0,22
Median	4,31	4,06	4,37	4,34
Minimum	4,02	3,8	3,9	3,85
Maximum	4,97	4,6	5	5
Amplitude	0,95	0,8	1,1	1,15
Variability coefficient	6,01	6,18	5,01	5,11
Standard error	0,05	0,05	0,03	0,03
The scatter	0,06	0,06	0,04	0,05
Trust level (95%)	0,12	0,11	0,70	0,71

**Table 6.** Accomplished progress by each group for 30m Running

Group	I.T.	F.T.	D = F.T.- I.T.	D <sub>F.T.-I.T.</sub> (%)
<b>Basketball</b>	4,23	4,07	- 0,16	- 3,78
<b>Football</b>	4,32	4,14	- 0,18	- 4,16
<b>Handball</b>	4,36	4,14	- 0,22	- 5,04
<b>Control</b>	4,40	4,37	- 0,03	- 0,68



**Figure 2.** The values of the arithmetical mean - 30m Running; IT, initial testing; FT, final testing; Group of Basketball, Football, Handball, Control;

## Discussions

### *Throwing the ball at oină (TBO)*

The Basketball tester group, at the final test, records an increase of 6,29% (2,9 m) from the initial test (see table 3).

The Football tester group, at the final test, records an increase of 3,87% (1,7 m) from the initial test (see table 3).

The Handball tester group, at the final test, records an increase of 10,88% (5,1 m) from the initial test(see table 3).

The Control group, at the final test, records an increase of 1,68% (0,74 m) from the initial test(see table 3).

From the variability coefficient's point of view, the basketball and the control group show a high homogenousness both in the initial test and the final one, whereas the football and handball groups show a moderate homogenousness at the two tests (see table 1 and 2).

Applying the dependant t test for the two tests, for each group, to check my hypothesis, it results that the differences between the arithmetic medians of the two tests ( $p < 0,05$ ) are statistically significant for the experimental groups and insignificant for the control group. From the statistic calculus and the analysis of the data using the simple dispersional analysis method ANOVA to compare the results of the final test between the control group and the experimental group, we can see that there is no statistically significant difference between the control group and the football group, the value of calculated F is lower than the critical F  $p < 0,05$ , but there is a statistically significant

difference between the control group and the handball and the basketball groups, F's calculated value resulting from the calculus being greater than critical F's value (Deacu, 2008).

### *The test 30m Running*

The Basketball tester group, at the final test, records an increase in time of 3,78% (0,16 sec) from the initial test (see table 6).

The Football tester group, at the final test, records an increase in time of 4,16% (0,18 sec) from the initial test (see table 6).

The Handball tester group, at the final test, records an increase in time of 5,04% (0,22 sec) from the initial test (see table 6).

The Control group, at the final test, records an increase in time of 0,68% (0,03 sec) from the initial test (see table 6).

From the point of view of the variability coefficient, the groups present a high homogenousness both in the initial, and in the final test (see table 4 and 5).

Applying the dependant t test for the two tests, for each group, to check my hypothesis, it results that the differences between the arithmetical medians of the two tests ( $p < 0,05$ ) are statistically significant for the experimental groups and insignificant for the control group. From the statistic calculus and the analysis of the data using the simple dispersional analysis method ANOVA to compare the results of the final test between the control group and the experimental group, we can see that there is no statistically significant difference between the control group and the other tester groups, F's calculated value resulting from the calculus being greater than critical F's value  $p < 0,05$  (Deacu, 2008).



In terms of the coefficient of variation, all the groups have a high homogeneity both in the initial test and final testing. Similar studies have been addressed by (Finichiu, 2011) and (Vaida, 2010).

### Conclusions

➤ Following the statistical processing of the results, we observed that at every test applied, the tester groups were superior to the control group, the differences between the arithmetic means at the final test were significant.

➤ The training program applied to the tester groups proved to be effective in correlation with the specific details of the driving qualities at the age of the subjects for the experiment who can no longer improve their values a great deal, because of the limited number of hours granted to practice and the surpassing of the critical periods of intervention.

➤ The methods of the sporting games can contribute to the improvement of the manifestation values of the conditioned capacities in the physical education and sporting classes.

➤ Through the use of the methods in the sporting games during the physical education classes with the students, a growth in the level of manifestation of the combined driving qualities at the experimental group through the results registered at the second test was observed, which confirms the correctness of the elaboration of the concept and the organised methodology, the development and the evaluation of the realised research.

➤ Identification tests for measuring motor qualities combined could be achieved, literature presenting these tests;

➤ Tests for measuring motor qualities combined can be supported in physical education and sports lessons without sophisticated equipment, sports grounds with equipment necessary to achieve them. Students quickly adapted to the requirements and tests have been sparked interest in knowing things about their movements.

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