

# **ABSTRACT OF THE DOCTORAL THESIS BY MR. FINICHIU MARIN**

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The theme of the doctoral thesis

## **OPTIMIZING THE PHYSICAL CONDITION OF STUDENTS FROM UNIVERSITY OF PETROLEUM USING SPECIFIC MEANS OF ATHLETICISM DURING PHYSICAL EDUCATION CLASS**

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Structured in 3 parts in the context of academic evaluation requirements of IOSUD – ANEFS and CNATDCU – MedCT, in **the first part I** accomplished the theoretical structure of the entire scientific process through presenting the used key words: optimization, athletic means, physical and sport education lesson, movement capacity and physical condition – human condition of existence which we analyse it in the conditions of physical and mental effort during the physical education lesson.

In this context we describe:

**a.** Notes concerning problems delimitation and explanation which this study presupposes; physical and sport education domain characteristics; the importance and novelty of the subject for the domain of physical and sport education; the motivation of choosing this subject; steps of research development.

**b.** The influence that physical education has on somato - functional characteristics, mental and movement of teenagers.

**c.** The characteristics of teaching physical education at higher technical learning through: content and structure of the physical education lesson; objectives and methodological system requirements; organizing and leading the physical education lesson; physical education lesson based on specific means from athleticism; characteristics of teaching athleticism during physical education lesson at university level; the effort during physical education level; evaluation during physical education lesson; physical exercise – the main way of realizing physical education objectives.

**d.** Physical education essential factor submitted to measurement and evaluation in the physical education lesson containing: definition, delimitation; physical condition components; movement capacity, definition, classification and pluri - factorial approach; elements of the instructive-educational process;

definition and presentation of rising and developments notions at the level of 18<sup>th</sup> – 19<sup>th</sup> years old teenagers.

e. Designing notions and planning the didactic activity that contains the definition of these notions but also the requirements of annual division, of the term plan, of the designing the learning units and of didactic project (lesson plan).

#### *Conclusions Part I*

- Physical condition components offer a continuous physical functionality as the man gets older and comprise the muscular force, muscular resistance and flexibility.

- Physical condition, through her objectives of improving the force, muscular resistance and flexibility, may rise the ability of resolving the problems of quotidian life concerning accidents prevention.

- Designing and planning the physical education activity permits reaching the instructive-educational objectives of the physical education subsystem – physical education at the university level, in order to obtain a functional independence during life.

- Physical education lesson is the only way of physical activity preparation and improvement of physical condition, education for health, for a healthy life style.

- School is an efficient instrument in offering education for the physical activity and self-knowing, of individual physical condition.

- The continuous presentation at the physical education classes assures a minimum of movement and allows the knowing and learning of techniques and activities of physical nature that must be continued during life.

- An educational program for rigorous elaborated health for helping teenagers, students to acquire more knowledge, to develop their attitudes and behavior customs to promote and maintain a physical active life style.

#### **Part II**

**The preliminary study of exploration and checking work instruments necessary to research concerning physical education onfluence with specially oriented content in order to improve physical condition**

Present:

a. Bio – professiogram of the specialist from petroleum industry with reference to the object and nature of the activity, physical, mental and intellectual order requirements, the profile and the profile characteristics in order to establish instruction models in the physical education domain such as the recognition scheme of favorable predispositions to improve the manifestation of physical condition.

b. Evaluation tests of physical condition, of anthropometric parameters, of functional parameters and physical development indexes but also the mental-social evaluation tests and of knowing the health state.

c. The pilot experiment has been carried on according to the managerial plan established by the coordinator of the doctor's degree, in conformity to the foresights IOSUD – ANEFS Bucharest, in the period april – may, second term, university year 2006-2007 and has as purpose the work techniques verification, the value of maneuvered variation, optimal conditions of its application, administration techniques of stimulus and answers gathering, etc. The development of the pilot experiment has been realized in the conditions of didactic process of students from the first year, Drilling and Extraction of Rock oil and Gas, Petroleum and Gas Engineering Faculty from the Petroleum – Gas University from Ploiesti. For checking the research instruments I used in the pilot experiment a lot of 38 students, first year, subjects having the same age (18-19 ), the same gender and they did not practice any professional sport.

#### *Conclusions Part II*

- Students have proved to be receptive to finding their manifestation level of physical condition and the value of anthropometric parameters.

- The team of professors from the didactic board has quickly adapted from organization and technical point of view in making the field measurements.

- Technical material and instruments have proved to be sufficient and well established

- The sport base of the Petroleum-Gas University from Ploiesti corresponds to the research's requirements

- Mean values calculated on the basis of data collected from the anthropometrical measurements show an evident plus for the students from the pilot batch in comparison with the mean values calculated for pupils measured in the comparative study from year 1990.

- The manifestation level of the physical condition and the general resistance for the students from the Petroleum University is at a weak to mediocre state, fact established through the two measurement tests of functional parameters – the Harvard test and Cooper test.

- We consider that there are motifs to hope that by applying the operational didactic program based on the athletic means and of students' receptivity to obtain at the end a real progress.

#### **Part III**

**Personal contributions concerning the optimization of physical condition of students from the petroleum university by using specific means of athleticism during the physical education lesson at the univeristy level**

Through the 4 chapters it presents:

a. The methodological operational frame of the actual experimented researches

b. Putting in practice the didactic operational project elaborated on the basis of athletic means

c. The obtained results and their interpretation

d. Conclusions, suggestions and recommendations resulted from the research

*The purpose of the research was:*

- to prove that athleticism, through the functions that it influences and the effects that are produced, must have a higher importance in establishing the instructional strategies that concern the physical condition improvement.

- The demonstration of the importance of the establishment of bio - professionogram of the petroleum specialist and the recognition of predispositions favorable to physical condition improvement, that must become a necessity in order to design and plan the activity of physical education.

From *the research's tasks* we remind some of them:

- Setting down the plan of the research development
- Setting down the working batch in order to experiment the operational didactic project on the basis of specific means from athleticism;

- Setting down the development level of physical condition of petroleum students (initial testing)

- The actual realization of the experiment

- Putting in practice the most efficient athletic means of the operational didactic project for improving the physical condition;

- Establishing the development level of the physical condition of petroleum students (final testing)

- The interpretation of collected data

*The research objectives*

- The realization of a study good to be put in practice concerning the optimization of the instructive-educational process on the basis of athletic means

- The discovery and establishing limited factors and favorable in the realization of instructive programs;

- Organizing the physical education on the basis of instructive models

- Testing a number as high as possible of students in order to gather a material of facts as rich as possible

- Processing the gathered data on the basis of statistic – mathematical methods which to make an objective interpretation

- The conclusions elaboration resulted from the accomplishment of the research and putting in evidence the relations between the study content and the practice activity content.

*Research hypothesis*

1. The knowing of the manifestation level of the physical condition of students may direction the methods and used means during the physical education at the university level.

- ❖ Although the analytic program of physical education presents a series of specific means of athleticism, it can be continuously improved and updated to the new scientific discoveries

❖ The quality and the efficiency of the instructive process can be improved in the conditions in which the instructional process will be oriented through the objectives accomplishment, of the content, strategy and evaluation of movement parameters, functional and anthropometrics.

2. The reference objects that foresee the improvement of physical condition will be better and more diverse realized on the basis of applying the means of instruction from athleticism.

3. The ways of instructions specific to athleticism make possible the solving of the ideal of physical education, through the development of movement capacities, of individual physical condition in light of solving the most diverse problems.

4. The training programs structured on instruction models from athleticism require the use of motivational reserves and the access to the beliefs of self attaining a better degree of movement levels

5. The usage of athleticism methods favor the differentiate improvement of the level of manifestation of the physical condition, the rhythm of progress being obvious from one semester to the other, on number of subjects and professional groups.

The methods and research techniques utilized in this study are part of *the category of investigation per say methods*:

- The observation method
- The questionnaire method
- The experimental method

*the methods of working, analysis and interpretation* of the data gathered through research:

- The measurement and recording method
- The statistic-mathematical method
- The logical method
- The graphic method

The application of the operational didactical program on the basis of means specific to athleticism, in the experiment, has been done on groups 1, 2, 3 and 4 from the Drilling and Extracting Rock Oil specialization, forming the experimental batch and the two groups in the Transport, Storage and Distribution of Oil specialization and the Oil and Rock Geology, forming the reference batch; the subjects are of approximate the same age, sex and do not practice any professional level sports.

The experiment has been realized in the conditions of the didactic process of the second year students, in the university year 2007-2008, the Oil and Gas Engineering specialty from the Oil and Gas University in Ploiesti.

After knowing the level of manifestation of the components of physical condition (initial testing) we passed to the applying in the physical education lesson of the Operational Didactic Program on the basis of the means specific to

athleticism which has occurred through planning the whole didactic activity on the basis of:

- *annual plan – the annual batching of learning units*
- *the calendar based semester plan*
- *the learning units design*
- *athleticism specific means*

By selecting a part of the measured results, tabled and worked over statistically- mathematical we present, from our point of view, the most representative aspects met at the level of:

*a. Movement capacities*

➤ *The mean value* computed after the two tests shows an improvement in performance on the second testing on all the 13 movement events;

➤ *The amplitude, standard error and the variability coefficient* show an collective with a high degree of homogenous behavior on the two tests and a normal distribution of the results excepting the tests to show the resilience in force regime of the abdominal musculature, the force regime resistance of the scapular-humerus flexors and the mobility of the spine and the coxo-femoral articulation – final testing

*b. The functional parameters*

➤ *The mean value* computed after the two tests shows an improvement in performance at the second testing on the 3 functional events;

➤ *The amplitude, standard errors and variability coefficient* shows a collective with poor homogenous behavior (Harvard test) and medium on the other functionality tests – initial testing and high homogeneity (vital capacity) and medium for the other two functional tests on the final testing, presents a normal distribution of the results.

➤ *Simple ANOVA*, for the two batches (there are seen the consequences appeared in the independent variable and we can see if that variable appeared at the dependent variable level has a meaning or not) (annexes, table 101) the value computed for the F report (1,148) on the meaning point  $p < 0.05$ , is greater than the table value, the table value for the meaning level 0.05 is 3.91 and 6.81 for the level of meaning of 0.10; the research hypothesis is valuable.

➤ *The “t” dependent test* (utilized for estimating if the students results from the experimental batch differs from the results of the students in the reference batch in the purpose of verifying the null hypothesis) (annex, table 102) on the point of meaning  $p < 0.05$ , how it can be seen the value of t computed is greater than “t” tabled; so the operational didactic program on the basis of athleticism means makes a great growth on the level of all the events tested in this research project.

Computing *the static indicators*, from the data gained through anthropometric measurements have shown that: the rhythm of the growth and development process has slowed down, fact underlined by the very small

differences found after computing the mean value after the initial testing and the final one of the anthropometrical parameters, on the two batches.

➤ *Nutrition indices* computed:

- *The Quetélet indexes* shows us an unsatisfactory state of nutrition;
- *The body mass indicia* is between normal values;

➤ *The harmony indexes*:

• *The Erissman indicia* computed shows a lack of harmony between the growth in thickness and that in length of the body of the researched batch;

• *The Adrian Ionescu indicia* computed shows a lack of proportionality between the length of the trunk and the waist;

• *The Amar indicia* computed targets the harmony between the length of the bust and waist is between normal values;

➤ *The respiratory (endurance) Demeny indicia* shows that ca mean values computed for the measured values in the tow batches is between normal limits, so they have a good pulmonary coefficient;

➤ *The thoracic elasticity* the mean values of this measured parameter are between normal values;

The computing of *the physical condition and endurance indicia*, after applying *the Harvard test*, brings out the high number of students that realize high marks after the final testing.

*The Harvard test* – scale of appreciation (points):

➤ *Excellent* < 90, *Good* between 80 - 90, *Medium* between 65 - 79, *Sub medium* between 55 - 64, *Weak* >54.

After *initial testing* a number of :

- ❖ 34% students = medium grade;
- ❖ 21% students = sub medium;
- ❖ 45% students = weak.

After *final testing*, the number of students which have recorded an *indicia* of physical condition and endurance more valuable has grown:

- ❖ 12% students = good grade;
- ❖ 31% students = medium grade;
- ❖ 26% students = sub medium grade;
- ❖ 31% students = weak grade.

Through *indirect determination of the VO<sub>2</sub> maximum in regard with the distance made in 12 minutes* in the *Cooper test*, we see the rise of the number of students which make a greater distance, after applying of the operational didactic program through usage of the means specific to athleticism.

After *initial testing*:

- ❖ 1 student (1%) = weak physical condition;
- ❖ 40 students (40%) = mediocre physical condition;
- ❖ 39 students (39%) = medium physical condition;
- ❖ 20 students (20%) = good physical condition.

After *the program and final testing*:

- ❖ 10 students (10%) = mediocre physical condition;
- ❖ 44 students (44%) = medium physical condition;
- ❖ 37 students (37%) = good physical condition;
- ❖ 9 students (9%) = excellent physical condition.

### *Conclusions Part III*

1. The computing of the static indicators of movement performances, after final testing, for the experiment batch, shows us a great growth in the mean values of the movement capacities (*annex, table 50*) as well as functional parameters (*annex, table 77*), comparative with the initial testing and the reference batch which has utilized just the means in the analytical program, confirming the research hypotheses of the scientific project.

2. The values computed for the meaning of a correlation coefficient are meaningful at the meaning point of 1.96 for  $p > 0.05$ , the research hypothesis is verified and the results may be generalized.

3. The value computed for the F report of the dispersion analysis simple ANOVA is meaningful at the meaning point established  $p < 0.05$  for all the events in which it has been tested the level of manifestation of the movement capacities and functional parameters (*annex, table 101*), being so confirmed the research hypothesis.

4. The computing of the “t” dependent test, from the results of the two tests which have followed the knowledge of the level of manifestation of the movement capacities and the functional parameters (*annex, table 102*), shows us that that is greater than the value of “t” table in the meaning point  $p < 0.05$ , so it is meaningful and the research hypothesis are valid, verified and the results can be generalized.

5. The finding of the physical condition and endurance indicia, after applying the Harvard test, brings out the large number of students which realize superior marks, after application of the operational didactic program and the effectuation of the final testing, compared with the initial testing.

6. Through the indirect determination of the  $VO_2$  maximum with respect to the distance made in the time interval of 12 minutes from the application of the Cooper test, we see the growth of the number of students which can cover a greater distance, after applying the operational didactic program by using means specific to athleticism.

### **Conclusions, suggestions and recommendations resulting from research**

1. The annual and calendar related planning has allowed us the unfolding of the physical education and sports classes for reaching the desired goals.

2. Throughout the research, confirming the research hypothesis, we have seen the systematic approach in the physical education and sports lessons management on the basis of the means specific to athleticism, there are created favorable conditions for:

- Promoting a mentality adequate to the understanding of continuous and systematic physical activity necessity in order to maintain ones health and improving the manifestation level of optimum physical condition, with respect to the future profession.

- Taking some decisions in concordance with the social importance of the national system of physical education in order to make some analytic structured programs on models of instruction from athleticism that require the use of motivational reserves and the access of self-exceeding preoccupations of individual movement levels.

3. Our experimental, pedagogical, prospective and improving measure justifies the definition of sport branch – athleticism as being:

- Main branch in choosing the most efficient and useful means for the physical condition development from the national physical education system but in a special way in the technical university subsystem;

- The association of the physical education lesson at the university level on the basis of athletic means to the athleticism school with the three groups: running, jumping and throwing.

4. Our experimental intervention shows that through ways of manifestation of physical education but also as a strengthening factor of health and socializing, physical condition improvement on the basis of specific means of athleticism can be addressed to all those interested in movement, not just to students.

### **Suggestions concerning the athletic exercises use in order to maintain an optimum physical condition**

On this basis we suggest the use of some programs based on athletic means (*resented in the sub-chapter 13.4*) and not only athletics, for maintaining and developing the physical condition in the independent activity, 3 - 5 times per week, for 35 - 50 minutes. We suggest that before starting a movement activity of a long period of time to make the medical control or whenever it is needed.

### **Recommendations to maintain an optimum physical condition**

The obtained results after the operational didactic program allow us to make the following recommendations:

- ❖ The effectuation of athletic physical exercises to determine the rise of the pulse at a value over 70% higher from the maximum that can be attained by each individual;

- ❖ Maintaining an optimum level of manifestation of the physical condition, can be realized by developing a work program followed 3 - 4 times a week.