

ABSTRACT OF THE DOCTORAL THESIS BY MR. CRISTEA DAN

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THESIS TITLE:

**EFFECTS THAT PROGRAMS AIMED AT OPTIMIZING MUSCLE
STRENGTH HAVE ON THE QUALITY OF LIFE OF STUDENTS AT
BUCHAREST POLITECHNIC UNIVERSITY**

Keywords: physical education at academical level, students, strength, quality of life

It's widely considered that the University and academic years are essential components of a society's civilization degree. It constitutes a space for social and intellectual development, for professional excellency of the next generation of citizens. Creating elites and academic excellency according to international standards in Europe and worldwide will lead the Romanian educational system towards long-awaited efficiency. Therefore we notice attempts to reshape University programs according to the professions' demands, in order to balance the education of future specialists with the current and future needs of a society where competition becomes stronger and stronger.

A student is basically a youngster who has just come out of the teenage years. The student is in the process of preparing and shaping up in order to become

integrated in the work field. For a student, the target and specific activity is to prepare to become a professional in the chosen field. Taking part in seminars, classes, laboratories and different types of practical activities, library study, preparing for exams, all these represent specific components of student life.

The specific tasks that physical education in high education institution is called upon to fix offer this discipline an important place in the complex and complete process of training future specialists. Students absolutely must be aware that it's highly important to exercise in order to maintain and fortify their health. They must be eager to practice sports, they must promote a dynamic lifestyle that's active, healthy and balanced and turn it into a social value.

Physical education in high education institutions creates the perfect bridge connecting “to be” and “to become” in a balanced transition that favors a full expression of a student's motor, mental and social potential.

It's unanimously recognized that those who practice physical exercise on regular basis have better health, are less vulnerable to stress, are more independent, have better social skills and are less aggressive. Specialists in this field estimate that those who practice sports are on the look for an optimal level of activism, as well as for a source for positive emotions and satisfactions.

Strength is a basic component of human motor system. It's an important factor for performance in sports but also for recreational activities or during the medical recovery process. Bringing the strength potential to the optimum level is a primary and permanent objective of physical education and sports. There are different intervention strategies in order to achieve this goal and they are specific for each education cycle.

MOTIVATION OF CHOOSING THE THEME

After current observations and practical findings during didactic activities, we've noticed with concern that the level of motor development in the different generations of students we've worked with is not at the desired level. It's the level of muscle strength that's most worrying. We believe that the main cause for this situation is a shallow approach during school cycles, with total disregard to the negative consequences on medium and long term. Therefore conducting this research project, this ameliorative research on this particular topic represents an important challenge for us. It also represents an opportunity to bring into specialists' focus the precarious level of youngsters' motor development, as the current situation requires urgent ameliorative intervention.

Based on these considerations, we believe that the interest for this topic is justified by an analysis of the effects that specific exercises meant to improve strength have upon one's health level, upon one's lifestyle and quality of life.

By addressing this topic, we've used a theory-based approach as well as an applied approach. This topic favors personal opinions, quality and quantity-based interpretations of the data resulting from the research, as well as establishing correlations between the results so that we identify an ameliorative solution. Therefore we believe that it's important to study the effects that programs meant to improve muscle strength have on students' physical fitness, lifestyle, level of health and quality of life. Such a step represents a research topic that is important, necessary and useful and based on young people's real needs.

THE PURPOSE OF THE PAPER AND THE RESEARCH HYPOTHESES

The purpose of the research:

The purpose of our research is to optimize the physical education process and sports at academic level. We believe this can be done by creating and implementing effective programs aimed at developing muscle strength. Strength is a motor quality that can be successfully improved during studentship, considering students' motor and morph-functional particularities.

We are also focusing on initiating realistic strategies and policies in order to develop physical education and sports activities of students from non-profile universities. The challenge is to ensure the perfect balance between intellectual and physical activities, aiming at optimizing youngsters' quality of life.

The objectives of the research:

In order to carry out this research in good conditions, we have set the following objectives: preparing the methodological framework needed for conducting the experimental study; delimiting, in theory, the basic concepts that are specific to the topic; a complex evaluation of the biometric level; evaluating the muscle strength indicators; creating and implementing programs aimed at optimizing the strength potential (independent variable); identifying and verifying the effects that the programs aimed at optimizing the strength potential had on students' lifestyle (dependent variable); identifying the effects on the functional indicators and analyzing the stress level.

The research hypothesis :

We assume that implementing effective programs that would optimize the strength potential, adapted to students' motor and morph-functional particularities, would result in better indicators of this motor quality.

If the students get to learn the operational structures that were used in the experiment and apply them in their daily independent activities, their fitness level will increase. At the same time, they will get an optimal balance between intellectual and physical activities, with favorable effects on the quality of life.

We consider that implementing the programs we've brought into attention, that are aimed at optimizing the strength potential, may have an effect a better quality of life, manifested in a proactive lifestyle, superior fitness level and an optimal state of health.

PROCEEDINGS OF THE RESEARCH

The research methods:

The study of the specialized bibliography

The bibliographic study was the basis of the theoretical foundation of the whole approach of research and consisted in studying the materials of a general nature, the papers, the magazines, the manuals, the books, and the publications in Romanian, English, French, the communications and the papers presented at some scientific sessions.

Pedagogical observation method

Under our approach, observation method involved the direct presence of the researcher at the educational activities that were conducted. The types of

observations used in the present study are: Direct observation (natural) was conducted during the physical education and sports classes, and we've looked at the students' overall level of activism, involvement in lessons, progress etc. Experimental observation was systematic, organized during the implementation of the program aimed at optimizing the strength potential. Observation was used in all stages of research.

Investigative method

A complex psycho-social research tool, the investigative method allows the researcher to obtain data that are of value and interest for the study, from a certain number of subjects, using questionnaires or interviews.

This method allows the researcher to get to know and analyze explanations and interpretations given by subjects on matters subjected to his interest and topic. In our study we've used the following questionnaires: the Cohen-Williamson test for self-evaluation of stress level; this questionnaire was designed to assess the degree to which individuals evaluate as stressful certain situations that occur in their lives.

The additional test designed to evaluate the global functioning (physical and psychological) SF-8 Health – Survey.

This test analyzes the quality of life and correlates it with the individual's state of health, therefore getting an overview of the subject's general state of health.

The questionnaire aimed at evaluating the individual's lifestyle

A healthy lifestyle represents a set of attitudes and practices that a person adopts, a set that has a significant impact on one's health and quality of life.

The experimental method

As a general trait, the experiment is designed to check a relation that's been established between two phenomena that the experiment-maker produces and controls. If we look at the experimental method typology, this paper addresses a pedagogical experiment that is ascertaining and ameliorative. The experiment is aimed at verifying previously formulated hypotheses concerning the effects of programs designed to optimize the potential of muscle strength on student's lifestyle and quality of life.

The statistical method

Statistics is a branch of mathematics that later became a separate science and method. As a method, it produces statistical connections between things, phenomena. As a method of processing data collected by observation, questionnaires, experiments, statistics imposed as a research method and have become indispensable.

The graphical method

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Stages of the experimental research

The experimental research was conducted during academic year 2012-2013.

Experimental group

Initial testing was conducted during the 8th – 12th of October 2012. Its aim was to get to know the initial values of the research parameters. Programs meant to optimize muscle strength potential were implemented over 23 weeks (15th of October 2012 – 12th of May 2013). Final testing was conducted between the 13th and the 17th of May 2013. The purpose was to highlight changes that occurred in the research parameters after programs meant to optimize muscle strength potential were implemented

Control group

Initial testing was conducted during the 15th and 19th of October 2012.

Final testing was conducted during the 20th and 24th of May 2013.

Stages of the experimental research

Period	Activity	Group
October 8 – 12, 2012	Initial testing	Experimental group
October 15 – 19, 2012	Initial testing	Control group
October 15, 2012 – January 11, 2013	Implementing the program aimed at optimizing muscle strength potential	Experimental group
May 13 – 17, 2013	Final testing	Experimental group
May 20 – 24, 2013	Final testing	Control group
May 6 – 10, 2013	Applying the questionnaires on quality of life	Experimental group
May 13 – 17, 2013	Applying the questionnaires on quality of life	Control group

The subjects and the research venue

For this research experiment 50 students were selected. All of them were students of the Bucharest Polytechnic University, all subjects are part of a homogenous group and their age is between 19 and 21 years. Subjects are in the first year of study at the Faculty of Electrical Engineering. The tests we've conducted with both groups – the experimental group and the control group – were conducted at the sports base belonging to Bucharest Polytechnic University.

Stages of implementation of strength optimizing program

Period	No. of weeks	Purpose	Content	Type of exercise
Oct. 15 – Nov. 9, 2012	4	Increasing general and segmental strength indicators	Circuit no. 1	Isotonic exercises
Nov. 12 – December 7, 2012	4	Increasing general and segmental strength indicators	Circuit no. 2	Isotonic exercises with TRX
December 10 – January 11, 2013	4	Increasing general and segmental strength indicators	Circuit no. 3	Isotonic exercises with apparatus
Febr. 18 – March 17, 2013	4	Optimizing general and segmental strength indicators	Circuit no. 4	Isotonic exercises with medicine balls
March 18 – April 14, 2013	4	Optimizing general and segmental strength indicators	Circuit no. 5	Isotonic exercises with TRX

April	15-	3	Optimizing general and segmental strength indicators	Circuit no. 6	Isotonic exercises with apparatus
May	12,				
2013					

Analysis and interpretation of the results

Having evaluated the anthropometric parameters and having analyzed the results, we noticed there were no statistically significant differences between the two groups that we've evaluated. Considering the subjects' ages and the fact that constitutional type is already shaped up at this point in their lives, we can understand why there are no statistical differences at these parameters.

The situation is different when we look at the other parameters we've analyzed during the experiment. When it comes to functional and motor parameters, there were significant differences between the results of the experimental group and the control group. Differences appear when we compare the results of the initial and final testing of the experimental group and also when we compare these results to those obtained by the control group. The results offer us grounds to state that the hypothesis of the research was confirmed.

When we conducted the questionnaires evaluating the quality of life in correlation with state of health and physical and psychological balance, the following aspects were highlighted. Subjects in the experimental group have a better physical and psychological balance, a better self-esteem and are more effective in performing their activity. Their perception of stress is 22.60 points (low stress level). The average level in the control group is 25.80 points (medium stress level). There are several indicators of an unhealthy lifestyle, but those aspects who were especially highlighted in the control group were: lack of a rational meal schedule, insufficient sleep hours, smoking, alcohol consumption,

hyper caloric foods packed with glucids, too few hours dedicated to physical activities.

What results from data analysis is that effects of interventions has influences on students' lifestyle and quality of life. This is the conclusion arising after we've analyzed the results from the three questionnaires.

In conclusion, we can assert that following the implementation of programs aimed to optimize the strength indicators we've noticed significant changes of the parameters we've looked at during the experiments. This was also confirmed by the dynamics of statistical analysis, thus confirming the experiment's results.

CONCLUSIONS AND PERSPECTIVES

- In the conclusions and perspectives section we are entitled to state that the hypothesis were confirmed
- It is necessary to show a more active preoccupation for an increase of indicators regarding the quality of life by determining individuals to be more responsible individual for their own health, lifestyle, physical condition, the aesthetic aspect of the body, for relaxation; all of these are essential elements of human capital, acquired through systemic and scientific practice of the physical exercise.
- Through education and self education, the students must became aware of the beneficial influences resulted from the constant practice of physical exercise; they must develop a real availability for practicing "exercises", under all its forms, for a better state of health, better professional performances, for a high quality life.

- It is necessary to capitalize the experiences that are specific to students' age and to find specific means and ways that would help them shape their attitude and habits that are favorable to practicing physical exercise throughout their lives in order to maintain a good quality of life in the current economic and social context. From this perspective we can consider the quality of life as being both a purpose and a result of human existence.