

PHD THESIS SUMMARY

"OPTIMIZING THE DEVELOPMENT OF AEROBIC RESISTANCE OF HIGH SCHOOL STUDENTS BY SPECIFIC MEANS AND METHODS OF FOOTBALL"

The research paper titled above contains a longitudinal experiment designed to verify the formulated assumptions. It has the following content:

INTRODUCTION

- Motivation of choosing the theme
- The importance of the theme
- The novelty of the theme
- The actuality of the subject
- The scientific originality of the work
- The theoretical importance of the work
- The practical significance of research
- Methods of research

Location of the topic in the context of scientific research in the field of physical and sports education and in the interdisciplinary and transdisciplinary context

Part I THE THEORETICAL SCIENTIFIC FUNDAMENTATION OF THE THEME

CHAPTER 1 PSYCHO-MORFO-FUNCTIONAL AND MOTOR PARTICULARITIES OF HIGH SCHOOL STUDENTS

- 1.1. Morpho-functional characteristics of pupils aged 14-18
- 1.2. The psychic characteristics of pupils aged 14-18
- 1.3. The motor characteristics of pupils aged 14-18

CHAPTER 2 PHYSIOLOGICAL ASPECTS OF EFFORT IN PHYSICAL EDUCATION LESSONS AND SPORTIVE TRAINING IN GENERAL AND IN THE FOOTBALL GAME IN PARTICULAR

- 2.1. The concept of effort
- 2.2. Classification and appreciation of effort
- 2.3. Limiting factors of effort
- 2.4. Systematization (rationalization) of resistance efforts and their standardization
- 2.5. Physiological aspects of the effort in football
 - 2.5.1. Aerobic and anaerobic power

CHAPTER 3 MOTOR QUALITY RESISTANCE AT IX-XII GRADES

3.1. Resistance, an important driving force in developing the capacity of effort of pupils aged 14-18, the age of high school students

3.1.1. Forms of resistance manifestation

3.1.2. Factors that favor the development of resistance

3.1.3. Strength development paths

3.1.4. The particularities of the development of resistance in physical education lessons in the 9th-12th grade students (14-18 years)

3.1.5. Methodological guidelines

3.2. The methodical procedures and means of developing resistance in the physical and sports education lessons, resulting from the study of the specialized literature

3.2.1. Methodological procedures of resistance development

3.2.2. Means of developing resistance in physical education lessons

3.2.3. Exercises for the development of resistance used in the physical education lesson at preliminary research

3.2.4. Methodological recommendations for the development of students' resistance in physical and sports education classes, by specific means of football

CHAPTER 4 THE THEORETICAL-METHODOLOGICAL BASES OF THE FOOTBALL GAMES IN SCHOOL

4.1. Football, a means of physical education and sports

4.2. Staging of football in education

4.3. Lesson of sports activities

4.4. The foresight of the physical education program related to the development of high school students' resistance

CHAPTER 5 RESEARCH METHODOLOGY

Part II PRELIMINARY RESEARCH TO OPTIMIZE THE DEVELOPMENT OF AEROBIC RESISTANCE OF HIGH SCHOOL STUDENTS BY AND SPECIFIC MEANS AND METHODS OF FOOTBALL

CHAPTER 6 PRELIMINARY RESEARCH ON THE OPTIMISATION OF AEROBIC RESISTANCE DEVELOPMENT OF HIGH SCHOOL STUDENTS BY SPECIFIC MEANS AND METHODS OF FOOTBALL

6.1. Prerequisites for preliminary research

6.2. Purpose of the preliminary investigation

6.3. Objectives and tasks of preliminary research

6.4. Preliminary research hypothesis

- 6.5. Organisation of preliminary research
- 6.6. Stages of preliminary research
- 6.7. The research methods used and their application
 - 6.7.1. The method of pedagogical observation
 - 6.7.2. The method of pedagogical experiment
 - 6.7.3. The test method
 - 6.7.4. The statistical-mathematical method
 - 6.7.5. The graphic representation method
- 6.8. The test battery
- 6.9. The apparatus and the materials used in research
- 6.10. The planning calendar of specific football game (independent variable) and athletics for the development of aerobic resistance of students
- 6.11. The Aerobic Resistance Development Plan established for the period 15 October 2015 to 15 May 2016 and implemented during the preliminary investigation

CHAPTER 7 RESULTS OF PRELIMINARY RESEARCH

- 7.1. Graphic representation, analysis and interpretation of data on samples

CHAPTER 8 CONCLUSIONS OF PRELIMINARY RESEARCH

Part III PERSONAL RESEARCH ON THE OPTIMISATION OF AEROBIC RESISTANCE DEVELOPMENT OF HIGH SCHOOL STUDENTS IN THE PHYSICAL EDUCATION CLASSES, WITH SPECIFIC MEANS OF THE FOOTBALL GAME

CHAPTER 9 DETERMINING THE FRAMEWORK OF EXPERIMENTAL RESEARCH

- 9.1. The subject of experimental research
- 9.2. The purpose of experimental research
- 9.3. The premises of experimental research
- 9.4. The subject of experimental research
- 9.5. The objectives of experimental research
- 9.6. The tasks of experimental research
- 9.7. The hypotheses of experimental research
- 9.8. The organization of experimental research
 - 9.8.1. The experimental group
 - 9.8.2. The control group
- 9.9. Stages of experimental research
- 9.10. Apparatus and Materials Required for Experimental Research
- 9.11. Methods of experimental research
 - 9.11.1. The method of study of specialized literature
 - 9.11.2. The method of pedagogical observation and registration

- 9.11.3. The sociometric survey method
- 9.11.4. The experimental method
- 9.11.5. The testing and measurement method
- 9.11.6. The comparison method
- 9.11.7. The method of analysis and synthesis
- 9.11.8. The method of difference
- 9.11.9. The statistical and mathematical method of processing and interpreting data
- 9.11.10. The graphic method
- 9.11.11. The method of statistical significance
- 9.12. The test battery for experimental research
 - 9.12.1. Strength tests
 - 9.12.2. Functional tests
 - 9.12.3. Somatic measurements
 - 9.12.4. Sociological test
- 9.13. The planning calendar of football and athletic specific means and methods for the development of aerobic resistance of students used in experimental research
- 9.14. The aerobic resistance development plan established for October 15-2016 - May 15, 2017 and its implementation during experimental research

CHAPTER 10 EXPLORATION AND INTERPRETATION OF THE DATA OF THE EXPERIMENTAL RESEARCH

- 10.1. The presentation of statistical data and calculations on lyceum (IX-XII), their analysis and interpretation
 - 10.1.1. Strength engine tests
 - 10.1.2. Functional tests
 - 10.1.3. Somatic measurements
- 10.2. The study of the distribution of the frequency of measured values in subjects, on samples, which allowed the construction of graphs based on which the results were analyzed intuitively, facilitating comparisons
 - 10.2.1. Somatic measurements
 - 10.2.2. Functional tests
 - 10.2.3. Strength engine tests
- 10.3. The synthesis of statistical indicators at final evaluation and their appreciation

CHAPTER 11 CONCLUSIONS AND PROPOSALS

- 11.1. The theoretical conclusions
- 11.2. The specific conclusions of the experimental research
- 11.3. Motions

BIBLIOGRAPHY

Keywords: resistance, optimisation, means, football, athletics, integrated.

Synthesis of the main parts of the thesis:

INTRODUCTION includes: the motivation of the choice of the theme, the importance of the theme, the novelty of the topic, the topicality of the theme, the scientific originality of the work, the theoretical importance of the work, the practical importance of the research, the research methods, the placement of the theme in the context of the scientific researches in the field of physical and sports education and in the interdisciplinary transdisciplinary context.

The work combines theory, practice and research thus providing a broad perspective on working with high school students in physical education lessons for the development of aerobic resistance. It is completed with an integrative work model for high school students.

-THE THEORETICAL-SCIENTIFIC BASIS OF THE THEME OF WORK

The research is built on a solid and current theoretical foundation, supported by the author's experience in working at the department. As a follow-up to the experiment, I refreshed my theoretical specialist knowledge on: the psycho-morphological and motor particularities of pupils aged 14-18, the physiological aspects of the physical education lesson and sports training in general and the football play in particular, the motor quality of resistance at the level of the pupils in the 9th-12th grades, the theoretical-methodical bases of the football game in the school, and last but not least, the scientific research methodologies in physical education and sport, also specified in the bibliography of the paper.

For more security in the research, we have decided to have two stages of approach:

a) The first stage was the preliminary research carried out on a small number of subjects, 29 students consisted of the experimental group and 30 students the control group aimed at optimising the development of high school students' resistance by specific means and methods to football. Its purpose was to find milestones to be based on further experimental research;

b) Phase II covered experimental research with the same theme but carried out on a representative sample of 680 pupils coming from Hunedoara County, out of which 371 formed the experimental group and 309 the control group. Groups with more than one number were preferred because the dependent variable (the result of the research) was as real, credible and representative as possible. The performance values of the subjects in both groups were centralized and statistically mathematical to the initial and final evaluation for analysis and interpretation.

-PRELIMINARY RESEARCH TO OPTIMISE THE DEVELOPMENT OF AEROBIC RESISTANCE OF HIGH SCHOOL STUDENTS BY SPECIFIC MEANS AND METHODS OF THE FOOTBALL

Part II includes the research hypothesis, the test battery, the equipment and materials used in the experiment, the planning calendar of the specific means of football and athletics for the development of students' aerobic resistance. By the preliminary study, with the application of the 10 samples (resistance, functional and somatic engines), we were able to find at micro level the efficiency given by the specific means and methods to football vs. those belonging to athletics. Analyzing the performance of the subjects before the training period systematically two semesters for the development of resistance (initial) and after (final), we found progress in the values declared at the final assessment in both groups, but higher for the experimental group, which was prepared with the specific means and methods to football. The average efficacy of the experimental group compared to the control group was 51.73% higher.

The statistical and mathematical calculations performed in the experimental group, whose subjects were trained to develop resistance aerobic only specific means and methods to football, have demonstrated consistent elevation of values, the samples after the preparation of the two terms school according to the planning calendar and to the development plan of aerobic resistance. The same statistical and mathematical calculations carried out in the control group, whose subjects were trained to develop aerobic resistance by specific means and methods to athletes, for the same period of time, have shown increases in recorded samples at final assessment, but smaller.

The 51.73% average efficiency, in favour of the subjects in the experimental group, over that of the control group subjects, shows the progress of students due to training with specific means and methods to football when aerobic resistance develops. This finding of the preliminary research certifies the hypothesis formulated by us and prepares the premises of the experimental research that we will address on a number of representative subjects (680) for the school population in Hunedoara County.

-PERSONAL DEVELOPMENT RESEARCH ON OPTIMIZATION OF THE HIGH SCHOOL STUDENTS' RESISTANCE DURING PHYSICAL EDUCATION AND EXTRA SPORTS CLASS BY SPECIFIC MEANS AND METHODS TO FOOTBALL

Part III includes the determination of the experimental research framework, the presentation of data and statistical calculations on samples, the study of distribution of measured frequencies in subjects and the synthesis of statistical indicators at the initial and final evaluation. The statistical calculations performed on the data obtained in evaluations of the subjects of the two groups the samples, the initial and final, they indicate the progress of the arithmetical mean values for each sample recorded, but it was higher in the experimental group compared to the control one.

The better results of the subjects from the experimental group compared to that obtained by the subjects from the control group, it is assigned to the implementation of the specific means and methods to the game of football, which systematically addressed in lessons throughout the school year resulted in a superior efficacy of the athletics, with which the control group subjects worked over the same time period. This is supported by the results of the experimental group subjects at the final evaluation, deduced by statistical and mathematical calculations on samples. In addition, the scientific approach to research shows that the difference between the mean of the experimental group and that of the control group is significant at the threshold $p < 0.01$ with a probability of 99%, the epsilon correlation coefficient and the "t" calculated are significant at the same threshold and the same probability. In conclusion, it is confirmed that the efficiency of the specific means and methods of football is real, the assumptions of the research are verified and accepted, and the null hypothesis is rejected. This confirms the similar conclusion resulting from the preliminary investigation.

The study of the distribution of the frequencies of the measured values in the subjects on the samples was concretized by graphical representation of the deviations of the individual values from the arithmetic mean. The graphs and tables corresponding to each sample result in an asymmetric distribution of the measured values, with their displacement to large or small values around the mean, but in both cases they are very close to a normal distribution, which is a "curve " also called 'Gaussian' or 'ogiva' 'by Gauss. The study of the distribution of the frequencies of the measured values in the subjects on samples, which have variations in addition to or minus the average, allowed us to build graphs on the basis of which we could make an intuitive examination of the results by facilitating comparisons by overlapping the curves on the figure.

If in the tests performed by the initial assessment of the control group and the experimental group had close values of the arithmetic average of the subjects' resistance index by high school level, we did not have the same situation at the final evaluation, which indicated a higher progress of the arithmetic mean of the experimental group compared to that of the control group. This is attributed to work in physical and sports education classes with specific means of football played during the two school semesters.

Chapter 10 consists of three subchapters. Each subchapter highlighted higher increases in the performances of the experimental group subjects who worked with specific means and methods of football. From the statistical calculations on samples, the initial and final evaluation performed on an experimental group of 371 subjects and on a control group of 309 subjects resulted in the same dependent variable that invalidates the null hypothesis, accepts and validates the assumptions of the research. This finding allows us to say that the efficiency of football specific means used to develop aerobic resistance is superior to that specific to athletics. So the efficiency of the specific means of football play is real when we follow the development of the aerobic resistance of the pupils' body and confirm the result obtained in preliminary research.

CONCLUSIONS AND PROPOSALS.

The result of the experiment was taken into account in a theory of the **conclusions**:

1. The dependent variable is in line with the assumptions;
2. The experimental introduction of the independent variable had a motivational structure that allowed us to optimize the development;
3. In addition to the efficiency of the specific means and the methods of football introduced in the training, the experiment showed the major desire and the interest of the students to participate actively in the integrated training with the football means and methods (82% of the 680 subjects surveyed requested to reveal themselves with specific means of football and only 18% opted for work with specific means of athletics). The outcome of the survey indicates that students accept and support the specific effort.
4. The result of the experiment leads us to the idea that the use in the physical and sports education lessons and the specific methods of football develop more the students' ability to work compared to the average and athletic-specific methods, which are not as attractive and mobilizing without the object of the soccer ball;
5. It follows from the foregoing that the use of resources and football-specific methods attest to superior efficacy toward the medium and the specific methods to athletics when we develop resistance.

Proposals:

1. Deploys optimization. R aerobics in lessons should be an element of interest for teachers. To succeed, the use of some tools in training and more efficient and agreed methods by students is an important factor in achieving the planned goal;
2. To develop R aerobics, we offer integrated training that is encouraged by students and produces emulation, subjecting them to sustained effort that produces fatigue to increase effort. At the same time, the integrated training solves other objectives of the physical education program: deepening the technical-tactical elements, strengthening the necessary game itself in the football competitions organized within the NATIONAL SPORTING SCHOOL OLIMPIADES;
3. To develop R aerobics we propose that the integrated work to be done according to the tradition of an approved sporting branch and pupils in a certain area of the country. It is essential that the sporting branch approached to please the students to create emulation among them.