

**NATIONAL SPORTS ACADEMY "VASIL LEVSKI"**



**FACULTY OF PUBLIC HEALTH,  
HEALTH CARE AND TOURISM**

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**DEPARTMENT OF WATER SPORTS**

**REFERAT**

**SUBJECT:**

**HEALTHY LIFESTYLE AND SPORT - WELLNESS COMPETENCE  
RESEARCH IN THE BULGARIAN SCHOOL**

*For awarding the scientific degree "Doctor of Sciences" in  
Professional direction 7.5. Health care*

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## **Introduction**

Education is the key to long-term health and well-being. By reaching children in their formative years we teach them the benefits of being healthy. The need to educate a Healthy Lifestyle and Sports (Wellness) culture from an early age is obvious. A representative idea relating to a global set of values for a healthy lifestyle shared by communities, professional groups and organisations.

The culture of a healthy lifestyle and sports carries a wide range of knowledge related to the specific field of Wellness. It can be considered through the prism of personal culture in a personal aspect, a collective approach of a group of organizations (mainly schools) to develop or achieve a culture in a healthy lifestyle and sport (Wellness) (Amaya, et al. 2019).

The aim is to identify areas for improvement, set performance targets and measure progress over time to achieve a healthy lifestyle in the Bulgarian school. Public policies targeting school settings are increasingly being used to address the effects of immobility. Their effectiveness depends on the practical application (Smith, et al., 2020).

There is a need to build a team of professionals for the permanent establishment of a Healthy lifestyle and sport (Wellness) in the Bulgarian school in the field of Well-being, (Willner, 2010). In order to improve the activity of preschool children and elementary school students, a school curriculum is prepared, reflecting the specifics of the school, as well as the needs and interests of the students. Based on the diversity of knowledge and skills, combined with harmony in the development of motor abilities. Emphasis falls on learning content in three compulsory, one elective and one additional area.

## **Actuality and importance of the topic**

The topic of this dissertation is applied in key competence No. 9 of the law on preschool and school education: skills to support sustainable development and for a healthy lifestyle and sports (ZPUO<sup>1</sup>, 2016; 2019; 2020; 2022; 2023). The present paper investigates the factors hindering or facilitating the application of school guidelines for sustainable development, a healthy lifestyle through physical activity. The coding introduced in the paper uses a constructive approach based on a theoretical model.

The Innovation Diffusion Model provided an organizational framework for presenting emerging themes. The key attributes of the model provide a stable framework for understanding the topics related to the implementation of Wellness policies and guidelines in the Bulgarian school. Training through educational software mozaBook, as well as the specialized Blaze-Pod Trainer application implemented in the experimental process.

## **Motivation**

The implementation of school-based Wellness Guidelines, the rollout of the Wellness for Kids initiative, marked one of the first innovative efforts to address the hypodynamia epidemic. The school policy on Healthy Lifestyle and Sport (Wellness) - a policy promoting the health, well-being and ability of students to learn by supporting healthy eating and physical activity.

The current study examines the implementation of the School's Wellness Policy using Diffusion of Innovations as a framework. Empirically based literature on the School Policy for a Healthy Lifestyle (Wellness) was systematically analyzed, analyzing theoretical statements and a set of empirical

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<sup>1</sup> ZPUO - Zakon za Preduchilishtnoto I Uchilishtnoto Obrazovanie

data, as a result of conducted scientific research and their corresponding mathematical-statistical analysis, indicating the state of the problem.

The goal of the initiative for a healthy lifestyle (Wellness) for children is to create awareness of the need for adolescents to actively participate in building and maintaining their own health. Through holistic practices in everyday life, aimed at reducing stress and aimed at increasing concentration, self-absorption, expressed in: energy medicine, movement and nutrition. Creating models in training in culture for a healthy lifestyle and sports (Wellness), which can be easily adapted to the conditions of modern kindergartens and school programs in the initial stage of basic education.

### **Scientific presentation of the study**

The subject of research are the indicators leading to effective management of systemic programs to achieve a culture of a healthy lifestyle (Wellness) in the Bulgarian school.

**Object of research** - the state and dynamics of the pedagogical process of achieving a culture for a healthy lifestyle (Wellness) in school, through the subject of physical education and sports, applying innovative methods and applications for wellness competence.

A total of 1,570 test studies were conducted, conducted individually and in teams. Experiments in practice covered a total of 67 indicators for measuring psycho-functional dynamics. Determining the state and development of the pedagogical process for Culture for a healthy lifestyle (Wellness): trends in age-sex dynamics, effectiveness of applied author's methods, increasing functional-motor capacity and motor activity, as well as research according to the European System of Control and Evaluation – Eurofit and establishing the effect of implemented innovative methodology directly related to the Blaze-Pod Trainer application.

**Research subject** - a total of 584 students from metropolitan schools and kindergartens were studied.

**The aim** of the dissertation work is to investigate the dynamics of motor capacity in preschool and primary stage to analyze the status of the legislative requirement for Healthy Lifestyle and Sports (Wellness) in the Bulgarian school by implementing innovative methods and applications for wellness competence.

**Main tasks** - To achieve the set goals, we went through the implementation of specific tasks from the theory, methodology and practice of the discipline of physical education and sports<sup>2</sup>:

1. Development of theoretical-methodological foundations of training and improvement of physical education and sports discipline, applying specifically selected educational tools and their implementation in practice;

2. Systematizing and summarizing the experience of training in a healthy lifestyle culture (Wellness) at school;

3. Research the specifics and objectify the training to achieve a culture for a healthy lifestyle (Wellness) in school;

4. Defining regularities and trends to increase efficiency in the pedagogical process for forming a culture for a healthy lifestyle (Wellness) in school.

**The working hypothesis** is based on the assumption that the application of innovative methods and approaches to improve the motor capacity of students, combined with applications for wellness competence, will allow personalization of pedagogical progress in preschool and primary stage and guarantee a culture for a healthy lifestyle and sports (Wellness).

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<sup>2</sup> The benchmarking-analysis of the Culture for a Healthy Lifestyle (Wellness) in the Bulgarian school carried out in the process of research activity is in response to key competence No. 9, requiring knowledge and skills for sustainable development, a healthy lifestyle and sports - ZPUO, DV . no. 11 article 77. (1), 02/02/2023, in its part: section II.

## **Main methodological concept**

Introducing a combined impact to achieve a Healthy Lifestyle and Sports (Wellness) in school, as a new approach to managing the curriculum of physical education and sports, through educational tests and applications for wellness competence. Based on the development and implementation in practice of innovative educational and functional-motor levels, allowing prediction of motor potential of students in preschool and primary stage of the basic educational degree in the profile: physical education and sports.

Based on the research on age dynamics and determining the relationship between main indicators of motor and functional development, motor activity and neuro-psychic reactivity of students and children - 6/10 years of age, motor development by gender was tracked, abstracting from ontogenetic development.

Monitoring the application of the European system for control and assessment of motor activity - Eurofit and establishing the motor potential in the profile: physical education and sports and carrying out a benchmarking analysis with the current educational system in our country under DOS. Comparison of the effectiveness, when establishing a Healthy lifestyle and sport (Wellness) in the Bulgarian school, with the aim of identifying the gaps in the curricula, establishing impacts and functional fitness, combined with the application of a Healthy lifestyle and sport (Well-being).

The methodological basis of our research is of a scientific applied nature, aimed at improving specific teaching practice. According to the essence and character of the goals, the research is constative in the statistical-mathematical part and innovative, in its part when approving purposeful practical experiments, based on affirmation of a Culture for a healthy lifestyle (Wellness) through an applied innovative methodology related to the specialized application Blaze- Pod Trainer.

Application of the author's methodology, based on complexes of corrective gymnastics and adapted yoga-practices in the conditions of a modern "Montessori-kindergarten", aimed at the prevention of postural disorders and correction of spinal distortions intended for children of preschool age.

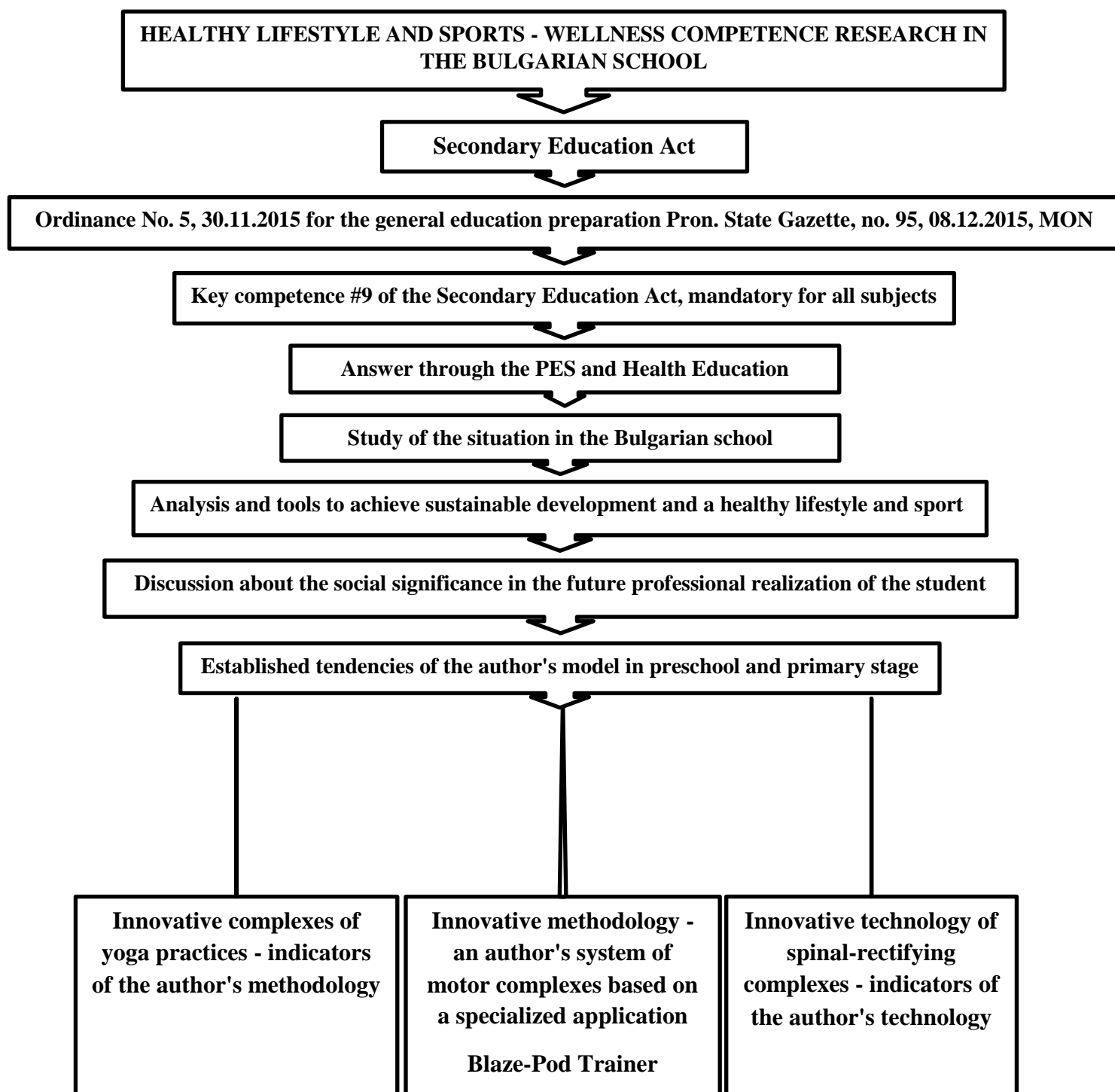
The developed levels of current research are based on multi-year studies, the effect of the impact of original and innovative practical-pedagogical models for developing motor capacity and increasing the motor potential of students in preschool and primary school at the basic educational level.

The application of all these innovative methods and technological models, their systematic research and analysis are based on accumulated practical and theoretical experience as a teacher of physical education and sports methods, covering the means and methods in teaching the subject at the initial stage of the educational degree.

Exploring the strengths of the Wellness Culture model for training, development and education through the development and implementation of innovative methods and technological models in educational practice, we will increase the interest and strengthen the activity of students not only from the primary educational stage /Kindergarten and primary school/, to systematic activities with motor activity, and we will contribute to the development of motor potential and increase motor capacity in subsequent stages of the educational levels /secondary and university education/.

Figure 5 presents a structural model of the dissertation work.





*Figure 5.*

*Structuring of the dissertation work*

## **Content structure**

Includes introduction, four chapters, list of abbreviations used, visual aids, bibliography and appendices - 1-5.

The introduction presents the motivation and relevance of the topic of the dissertation.

In the first chapter, the statement of the problem is presented, while the theoretical-methodological aspects of a healthy lifestyle and sport are examined by tracking the dynamics of the global indices for well-being and happiness, the trends for the formation of a Culture for a healthy lifestyle (Wellness) and current trends for the prevention of spinal curvatures. The conceptual basis of the research in the present dissertation is laid.

In the second chapter, the methods and organization of the general and specialized methodology of the doctoral work, the purpose, the object and the subject, the hypothesis and tasks of the dissertation, the subject-object area of research, the stages, planning and direction of the experiments are presented. The boundaries of the problem, the working hypothesis and the main methodological concept are clearly outlined. In this work, a first attempt is made to establish the presence of a Culture for a healthy lifestyle (Wellness) in the Bulgarian school, tracking the motor potential of adolescents through the application of innovative methods and technological models. The research was carried out at the preschool and primary school stage of the basic educational level.

The third chapter presents an analysis of the results with scientific-applied and methodical aspects of the motor potential, summarizing the experience of managing training in preschool and primary school stages. A detailed analysis of theoretical and experimental research is provided for the application of developed models for managing the effectiveness of programs to improve the health of

adolescents by improving motor potential, proving the effectiveness of specialized tools for functional control and assessment in the educational system, and analyzing the specifics of managing the training for a culture of a healthy lifestyle (Wellness) in the Bulgarian school.

The fourth chapter presents: conclusion, conclusions, recommendations and the contributions of the dissertation work. The performed analysis of the results allows the formulation of scientific conclusions detailed on page 66 of this abstract.

**Publications** for the dissertation are listed at the end of the abstract on page 70.

**Dissertation volume** - The text of the dissertation covers 264 pages, structured in four chapters, 114 tables, 92 figures, 12 graphs /in appendices/, 17 diagrams and 2 schemes. In the appendices 1 to 5 are structured in electronic format in a separate body, which is an integral part of the doctoral thesis. There are 118 literary sources, of which 54 are in Cyrillic and 64 are in Latin. Table 114, page 104 of the dissertation contains a systematized description of the research contingent and visualization tools.

The numbering of tables and figures in the abstract corresponds to those in the dissertation.

## **Chapter One**

### **I. Theoretical and methodological aspects of the problem**

#### **I.1. Dynamics of global indices of well-being and happiness**

Global happiness and well-being policies are developed by the Global Happiness Council and expert working groups. Aimed at government policymakers interested in formulating and defining the mental health economy, it examines the programs and products driving the mental health economy. The global mental health economy is estimated to be worth \$121 billion and influences welfare policy. This data influences the policy for financial Wellness and Well-being of the European nations. Measuring Wellbeing does not take into account other factors that also contribute to people's happiness, such as environmental quality, crime, political freedom and intergenerational altruism. Although there are shortcomings in all measures of Well-being, the Nordic countries rank better in all indicators, reminding us that they are the benchmark. The distribution does not change health status, income, employment, marital status or safety, all of which are more favorable on average.

Systematization is lacking in assessing the sustainability of smart technologies applied in mobile healthcare. The literature only models the improvement in percentage of successful referrals so as to assess the clinical robustness of the system. Research in the field is not limited to specific smart devices. Sustainability, unlike technology adoption, is a long-term concept and not all existing smart technologies are applicable in a mobile environment. As an obstacle to existing applications of smart technologies are laws limiting the possibility of remote medical assistance. Artificial intelligence is shaping up to be the leading technology of the 21-st century. Different forms of government interventions can strengthen the artificial intelligence ecosystem, clarifying the state of innovation funding, exploring the development of funding mechanisms, pointing out the progress and challenges provoked by Covid-19.

## **I.2. Trends for the formation of a culture for a healthy lifestyle (Wellness)**

The overall philosophy, rules and practices for a better lifestyle are based on key concepts such as: well-being, motor and mental health. Wellness culture is rooted in ancient movement and spiritual practices aimed at making the human spirit and body more resilient to potential threats.

Unlike classical modern medicine, focused on treating existing diseases and suppressing symptoms, Wellness Culture is part of a more holistic approach, focusing on prevention and recreation. The culture for a healthy lifestyle (Wellness) is an expression of the desire to weaken the main factors for some of the most terrible "modern" diseases - hectic everyday life, stress, immobilization and unhealthy eating. The culture for a healthy lifestyle and sports (Wellness) covers all areas - career, social communication, motor and intellectual development, emotional and spiritual state and is aimed at building harmony and balance between needs and the world around us through sports, relaxation, balanced nutrition, fun, positive relationships and emotions and last but not least a positive-stimulating work environment (Walsh, 2011).

The exponential increase in anxiety, depression and other mental health issues in students is creating classroom conditions that most teachers are not trained to handle. By training a mental health team, we take the first step towards building a school Culture for a healthy lifestyle and sports (Wellness). Mental wellness education is the first step to changing school culture. The creation of a strategy accessible to schools, providing effective results, the school Wellness culture is confirmed, building an optimal academic environment and enriching the tradition in Bulgarian education.

### **I.3. Current trends in the prevention of spinal distortions**

Literary data indicate a change in the methodology and a decrease in the precision of the study, rather than a decrease in the frequency of spinal deformities during the years studied. During the mentioned years, there was an effective system for the prevention and treatment of spinal distortions, and the authors' conclusion is justified, but in the modern conditions of health care, the problem of the lack of such a system is particularly relevant.

The big difference in percentage ratio in prevalence of spinal curvatures in individual cities of Bulgaria is related to the fact that the method by which deviations are established is too subjective and the research was conducted in different conditions. Different people have different posture. It is strictly individual, personal and unique, just like the expression on the face of an individual person. In the absence of adequate prevention (corrective gymnastics, training in correct posture, training in the correct performance of activities of daily life), the monitored contingent is at risk for the appearance of spinal distortions.

From what has been said so far and the review of research carried out, it can be concluded that the presence of incorrect posture in children appearance of spinal distortions. Emotional processes help to develop fixed patterns of posture.

The topic of this dissertation is applied in key competence No. 9 - skills to support sustainable development and for a healthy lifestyle and sports from the law on pre-school and school education, as a requirement for learning outcomes in the subject of physical education and sports in primary stage of basic educational degree (ZPUO, 2023).

There are legislative changes in the development of the educational system in Bulgaria after 2016, with the entry into force of the new Law on Pre-School and School Education, and they are imperative. Dictated not only by the criticisms and recommendations of the European Union, but also by the fact that alarming

trends are being observed, permanently having a negative impact on the entire society.

With the adoption of the new Law and the Regulations to it, a new education is started, guided by the needs of children, as well as the desire for cooperation between teachers and parents - a guarantee for lifelong learning. With the adoption of the Law on Pre-school and School Education and Ordinance No. 5 of the Ministry of Education and Culture (ZPAO, 2016), a change is made in the number of scheduled weekly situations in the educational direction "Physical Culture", in accordance with the DOS and the need to increase motor activity, improve motor skills and healthy habits. As from two mandatory regulated situations, there are three main forms of pedagogical interaction (ZPUO, 2023).

## **Chapter two**

### **II. General and specialized methodology of the dissertation work**

#### **II.1. Limitation of the problem, working hypothesis and main methodological concept**

The derived summaries lead to the formulation of a basic methodological concept of the doctoral thesis.

Introducing a combined impact to achieve a Healthy Lifestyle and Sports (Wellness) in school, as a new approach to managing the curriculum of physical education and sports, through educational tests and applications for wellness competence. Based on the development and implementation in practice of innovative educational and functional-motor levels, allowing prediction of motor potential of students in preschool and primary stage of the basic educational degree in the profile: physical education and sports.

The working hypothesis is built on the assumption that the application of innovative methods and approaches to improve the motor capacity of students, combined with applications for wellness competence will allow personalization of pedagogical progress in preschool and primary stage and guarantee a culture for a healthy lifestyle and sports (Wellness).

This will provide an answer to the legislative requirement for knowledge and skills for sustainable development and a healthy lifestyle and sports through the means of the subject of physical education and sports (key competence No. 9 in the Law on Secondary Education<sup>3</sup>).

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<sup>3</sup> ZPUO, DV no. 11 article 77. (1), 02/02/2022, in its part: section II.



## **II.2. Aim, tasks, subject, object, organization and methods of the research**

**The aim** of the doctoral thesis is to investigate the dynamics of motor capacity in preschool and primary stage to analyze the status of the legislative requirement for Healthy lifestyle and sport (Wellness) in the Bulgarian school by implementing innovative methods and applications for wellness competence<sup>4</sup>.

To achieve the set goals, we went through the implementation of specific tasks from the theory, methodology and practice of the discipline of physical education and sports:

1. Development of theoretical-methodological foundations of training and improvement of physical education and sports discipline, applying specifically selected educational tools and their implementation in practice;
2. Systematizing and summarizing the experience of training in a healthy lifestyle culture (Wellness) at school;
3. Research the specifics and objectify the training to achieve a culture for a healthy lifestyle (Wellness) in school;
4. Defining regularities and trends to increase efficiency in the pedagogical process for forming a culture for a healthy lifestyle (Wellness) in school.

**The subject** of research are the indicators leading to effective management of systemic programs to achieve a culture of a healthy lifestyle (Wellness) in the Bulgarian school.

**Object of research** - the state and dynamics of the pedagogical process of achieving a culture for a healthy lifestyle (Wellness) in school, through the subject of physical education and sports, applying innovative methods and applications

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<sup>4</sup> The benchmarking-analysis of the Culture for a Healthy Lifestyle (Wellness) in the Bulgarian school carried out in the process of research activity is in response to key competence No. 9, requiring knowledge and skills for sustainable development, a healthy lifestyle and sports - ZPUO, DV . no. 11 article 77. (1), 02/02/2023, in its part: section II.

for wellness competence.

A total of 1,570 test studies were conducted, conducted individually and in teams. Experiments in practice covered a total of 67 indicators for measuring psycho-functional dynamics. Determining the state and development of the pedagogical process for wellness culture: trends in age-gender dynamics, effectiveness of applied author's methods, increasing functional-motor capacity and motor activity, as well as research according to the European Eurofit control and assessment system and establishing the effect of implemented innovative methodology directly related to the Blaze-Pod Trainer application.

**Research contingent** - a total of 584 students from metropolitan schools and kindergartens were studied.

In the first preliminary experiment used in creating the theoretical construct in the first main experiment: /app. 1 – page 1/.

The study included 120 children aged 5-6 years from a metropolitan kindergarten. For the purposes of the study, they were divided into two target groups, with 60 children in each group. In EG<sup>5</sup>, specially adapted complexes are practiced twice a week, applied according to an innovative methodology, consisting of yoga practices. In the CG<sup>6</sup>, advanced training sessions were conducted in the field of physical education, included in the DOS curriculum. To complete the tasks, achieve the goal and prove the hypothesis, a complex methodology was applied: literary sources were studied, a survey among the parents of the children involved in the experimental activity and a practical example was presented. mental methodology of adapted yoga practices.

Second preliminary experiment used in creating a theoretical construct in a second main experiment: /app. 2, pp. 25 - 32/.

A study was conducted in a metropolitan school during the academic year 2018/19. From the presented theoretical statements regarding: functional

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<sup>5</sup> EG - *Experimental Group*

<sup>6</sup> CG - *Control Group*

dynamics, motor activity and neuropsychic reactivity, a study was conducted among 182 students - 47% boys and 53% girls, 7-10 years old. The main condition for the implementation of the experiment is knowledge of the age-sex characteristics of the students - an object of cognitive impact.

Within the scope of the research, innovative technology was applied and the following was tracked: status in teaching methodology in the subject of the PES<sup>7</sup> - initial stage of a basic educational degree and educational standards for the development of motor quality agility. To derive a relationship between indicators, an analysis of dynamics was applied through mathematical-statistical processing to derive variation and correlation coefficients.

An innovative technology was tested for the development of motor quality agility and to establish its influence on motor capacity. A statistical verification of the effectiveness of the approved methodology was presented with the following: organization of experimental work in three stages: ascertaining, training and control /appendix 2, pp. 32-33/.

**The aim** is to establish and assess the presence of a Healthy Lifestyle and Sports (Wellness) in a school at the primary level of education, applying an innovative methodology for the development of motor quality, agility and increasing motor capacity in PES training, consisting of an author's complex of motor exercises related to using a specialized Blaze-Pod Trainer application and checking its effectiveness in practice.

**The subject** of the analysis tracks indicators that allow for harmonization and individualization of the differences in motor potential between specific target groups and establishing the effectiveness of the applied innovative technology. The drawing of scientifically based conclusions will allow to establish the presence or absence of a Culture for a healthy lifestyle (Wellness) in the Bulgarian primary school.

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<sup>7</sup> PES - Physical Education and Sport

**The object** is specific indicators measured by objective and reliable instruments, their systematization and analysis /description of the innovative methodology of the conducted experiment - app. 2, pp. 25 - 44/. The motor skills: agility, quickness of reaction and coordination are basic elements that are constantly improved through an interactive method, different from the usual PES classes - embedded in the curriculum of the 3-rd grade. Exercises related to the Blaze-Pod Trainer system: exercises in square; exercises on ladder; wall exercises; ground support exercises; exercises in a semicircle on the ground; slalom exercises; starting reaction; balance exercise on a device; sticky balls in a circle under diodes; catching a ball and putting it in basket.

Third preliminary experiment used in creating the theoretical construct in the third main experiment: /app. 3, pp. 58 - 77/.

The research included 183 students /60% girls and 40% boys, 9-10 years old, tested according to the European Eurofit system, twice a week in 40 min. lessons on PES. Distribution: one class with advanced study of music, two with study of fine art and five with choreography /appendix 3, tab. 1a and 2a pp. 58 and 59/.

The experiment was conducted: 09-2021/05-2022. The students were tested after a 15-minute warm-up. Measurements were carried out according to the current Methodological Guidelines. The data was analysed and compared with newly obtained Eurofit scores. The European test battery includes 10 tests, with an endurance run optional between two tests. Due to the low age limit, application of the running test was carried out within 90 seconds. For 9 years /3rd grade/, and endurance running test - 1.5 mile /2414 m/ was applied for 10 years /4th grade/.

According to Eurofit, anthropometric data are also analysed, and the current study focuses on tests conducted to establish motor capacity of 9/10 years old kids /detailed description available in appendix 3, pages 58-70/ and a benchmarking analysis with the current state educational standards.

## Classification and argumentation of research methods

**In summary**, the development contains categories of scientific methods for research, applied depending on the intermediate goals of the pedagogical experiments, which are as follows:

### **Research methods**

- For diagnostic analysis of the system:
  - Literary analysis;
  - Benchmarking-performance analysis - includes collecting and comparing quantitative data (measures, key performance indicators). Comparative analysis of effectiveness - a first step taken to establish a Healthy lifestyle and sport (Wellness) in school.

**Purpose** – identification of program gaps, impacts, functional fitness, implementation of Healthy Lifestyle and Sports (Wellness);

- Theoretical modelling (prognostic and normative);
- Mathematical-statistical modelling.
  - Forecasting methods - The system for control and evaluation of the effectiveness of the applied innovative methods and technologies for Healthy Lifestyle and Sports (Wellness) in the Bulgarian school, which we offer for implementation in the practice of education and training in conditions of preschool and school wellness.

In this material, we present the training according to the author's methodology of Healthy lifestyle and sport (Wellness) in the Bulgarian school in response to key competence No. 9 of the law on secondary education: support of sustainable development and healthy lifestyle and sport.

In accordance with the objectives, the author's methodology contains:

- Methods of influence: Motor; Functional; Psycho-motor.
  - Methods with social relevance:
- Harmonization of the theoretical construct with European priorities;
  - Introduction of educational levels in educational innovative methods and technologies for Healthy Lifestyle (Wellness) in school;
  - Adaptation of the European practical-methodological experience for the needs of the Bulgarian education system.
- Methods for measuring and establishing functional status:
- Conducting field tests;
  - Pulsometry and dynamometry.
- Setting an objective final assessment:
- Normative assessment table;
  - Assessment by criteria and indicators;

Conducting control tests for concentration and attention span, determining the degree of flexibility, coordination and short-term skills, functional dynamics and motor activity.

The measurement of the separate tests is carried out by the teaching medical staff and the responsible teacher. At the beginning of the experimental methodology and after twelve months, the following parametric motor indicators were studied, and for this purpose the following tests were used:

- Depth of slope /cm. / - degree of physical quality, flexibility;
- Matiash test – establishes a degree of postural violation;
- Test - proofreading test Bourdon /modified and adapted/ - concentration attention /check/.

Methodical description and implementation

Text - Depth slope /cm/ - establishes flexibility lower limbs

Matiash test - / scheme 1, diagram 1, page 16/. Empirical values of measured indicators / app. 1, table 4, page 16/.

Test - concentration and sustained attention - Proofreading test Bourdon / adapted and modified; /appendix 1, diagram 2, page 17/

Control tests for measuring functional dynamics and motor activity /regulated and standardized/:

Test 1: Running 50 m.

Test 2: Standing long jump

Test 3: Throwing a solid ball 1 kg.

Test 4: 200 m - running /table 5 and 6, appendix 1, page 19/.

Summary results - graphical form - /figure 7, appendix 1, page 20/.

Ball throwing test /150 g/ in a goal /horizontal and vertical/

- First part: return to a horizontal target

- Second part: shooting at a vertical target

The applied test batteries allow individualization of the results and determination of the level of functional motor activity.

Research methods and didactic tools - experimental studies - preparatory group - /6-7 years/

For the purposes of experimental research, the following diagnostic and mathematical-statistical methods were used to establish, evaluate and analyze achievement results:

Mathematical and statistical methods;

- Variation analysis – V - variation coefficient / page 117/;
- Correlation analysis – r – Fexner correlation coefficient / page 115/;
- Proving a hypothesis - t-criterion Student /p. 112; app. 5, page 86/.

Motor activity diagnostics tests /appendix 5, page 82/

- Motor activity is reported according to a control and assessment system.

Tests - fourth age group:

- 50 m.- running;
- Long jump with two legs;
- Throwing a solid ball 1kg;
- 200 m. - running
- Tabular and figure methods - presentation of data and dependencies:
- Histograms; Pie charts (pie); Tables; Figures.

Graphical methods - visualization of the data from the diagnostic procedures performed during the experimental study.

The concentration of attention was calculated as an integer obtained from the divisor - the number fixing the successful attempts and the denominator - the number fixing the wrong attempts. We count wrongly drawn and correctly processed figures /Bourdon test - appendix 1, page 17/. Calculated coefficient - correctness and registered indicators /app.1, table 8, page 20/.

### **Used statistical research methods**

The obtained empirical data were statistically processed using software packages Excel 5.0, StatisticaforWindows 5.0, as well as a statistical calculator / description appendix 5, page 84/



Control tests for measurement - functional dynamics, motor activity and neuropsychic reactivity

An experimental control study was conducted in the form of testing. To establish the level - functional dynamics, motor activity and neuro-psychic reactivity, we conducted control tests in five main groups /appendix 2, page 25/:

A. Anthropometric indicators: detailed description - app. 2, page 26

1. Standing height
2. Body mass
3. Chest girth-pause

B. Physiometric indicators:

1. Power right - left hand
2. Standing force
3. Living capacity
4. Description of pulsometry for 10 seconds and 1 minute

C. Parametric indicators for measurement - motor potential /functional dynamics and motor activity/:

1. 40 m. running with a high start
2. 200 m. running
3. Throwing a small solid ball - 150 g.
4. Throwing a ball - 1 kg.
5. Long jump from standing
6. Long jump with reinforcement
7. High jump

D. Indicators of neuropsychic reactivity:

1. Speed of a simple motor reaction to a light stimulus of the upper limb
2. Maximum frequency of movements
3. Emotional resilience

D. Technical strain gauges:

1. For the long jump from a place with two legs were recorded:

- average rebound force -  $F_{\text{average}}$  /kg/;
- maximum rebound force -  $F_{\text{max}}$  /kg/;
- force impulse -  $I$  /N/s/.

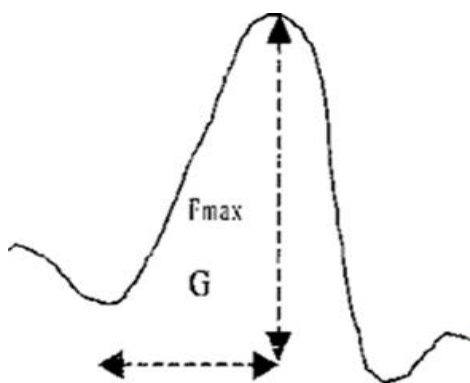
2. For long jump with boost:

- stepping force –  $F_{\text{stepping}}$  /kg/;
- damping force -  $F_{\text{damping}}$  /kg/;
- rebound force -  $F_{\text{rebound}}$  /kg/.

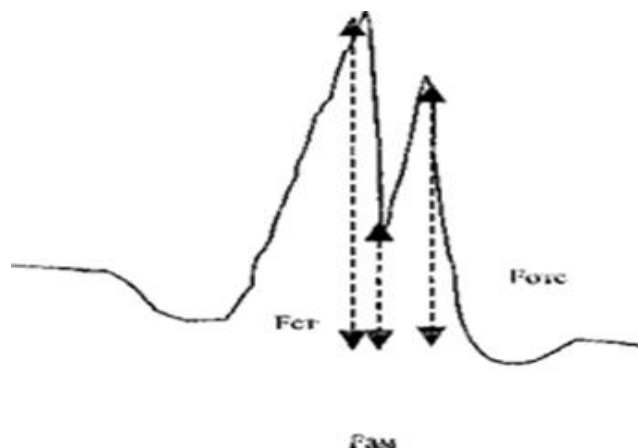
The values of the technical parameters were calculated as follows:

- Calculation of average rebound force –  $F_{\text{av}}$ ./description app. 2, pp. 12./

**Figure 6. Strain gauge record -  
Long jump from place**



**Figure 7. Strain gauge record -  
Long jump with reinforcement**



The data collected and processed from the studied indicators are sufficient to obtain information about: functional dynamics, motor activity and neuro-psychic reactivity. A detailed description of the applied methodology, as well as the empirical values in the experimental part, are described in appendix 2, pp. 25-32.

To establish a relationship between motor quality, agility and motor potential, control tests were conducted to establish - six parametric indicators /appendix 2, table 9, page 34/.

- 30 m. - running
- Standing long jump
- Throwing a ball - 1kg.
- Running 200m. – shuttle
- T-test – motor quality agility /tab. 10 and 11, app. 2, pp. 34 and 35/.

Applied methodology during the research:

- Research literary sources on the subject;
- Development of an experimental methodology, including an author's complex
- Testing original and varied methodical resources for developing motor quality, agility and improving motor capacity.
- Conduct field tests.
- Analysis of empirical data and generalization of results.
- Drawing conclusions and recommendations - improving the development of motor quality, agility and improving motor capacity.

The complex impact on the development of basic motor qualities requires work on a precise methodology in selective formation. The special training is aimed at developing motor qualities and abilities according to the specifics. For this purpose, we included in the experimental methodology an author's complex to develop specific qualities combined with variability of habits and skills:

- general-preparatory: exercises of a naturally applied nature, generally developing and structural, which are important for comprehensive motor and functional development, strengthening health and preventing spinal distortions.
- special-preparatory: exercises on structure;
- exercises that increase load in motor training /detailed information - appendix 2, pages 35-40/.

For a detailed description of the applied innovative author's complex based on the Blaze-Pod Trainer system, see appendix 2, pp. 35-45;

The research is based on mathematical-statistical methods with included variation analysis: in accordance with the purpose and tasks, the factual material was subjected to statistical processing through variation analysis - to determine average values and deviations of indicators with the calculation of average parameters / appendix 2, page 52 - 57/.

- Variation analysis – V - determination of variation coefficient - information about dispersion of the sign, expressed in % /app. 2, page 52/
- Correlation analysis - r - determining the Pearson correlation coefficient. Establishing interrelationships between the quantity-factor /speed/ and the quantity-result /force/ - /appendix 2, page 56/

Control tests for approval according to the European motor potential evaluation system - Eurofit /9-10 year old students/.

Fitness opportunities affect the qualitative and accelerated mastering of various, complex motor actions, which lie in the main cores of the curriculum for the respective class, according to the current State Education Standards (SES, 2022).

There are no points in the Eurofit system, each result corresponds to an assessment, and this makes it easier to apply and efficient. According to the European system (Eurofit, 2022), nine tests were conducted as follows:

- Test battery - third graders, consisting of four tests: 50 m. Running; Long jump from standing; Throwing a ball - 1kg; Running - 200 m.
- Test battery - fourth graders, consisting of five tests: 50 m. Running; Long jump from standing; Throwing a ball 3 kg./boys/; Lifting - rear leg /girls/; 300/600m. running - agility and agility tests.

Assessment of motor activity (Marinov, 2020): dynamometry, chronometry, tempometry, distance measurement. Detailed description of tests - Eurofit – app. 3, pp. 63-68.

- Theoretical analysis of scientific literature and government documents;
- Mathematical-statistical data processing:
  - alternative analysis: quantitative information /relative share - %/;
  - variational analysis: carried out using: Microsoft Excel.

It is of interest to determine the following quantities:

X - The average arithmetic value - for each indicator;

d - Growth - the quantitative expression in relevant measurement units;

St - Standard deviation - degree of dispersion values around the arithmetic mean value;

R - Range - difference between the smallest and largest scattering value;

V% - coefficient of variation - determination by different signs.

- ❖ Tabular methods /Microsoft Excel/
- ❖ Regression analysis – r.

## Introverted Relationship - Preliminary and Basic Experiments

The present dissertation consists of two inseparable parts, describing the activities carried out in three main and three preliminary experiments, but subject to the goal and working hypothesis defined in chapter two. For convenience, a figure is proposed to illustrate an introvert relationship between preliminary and main experiments.



**Figure 8.** *Introverted relationship between preliminary and main experiments*

Structurally summarizing the development and selecting the text, we have structured applications 1-5, built on the logic of the main material, following the content. It is indicated by pages, chapters and parts, to which point of the main material details are given in appendices. In this sense, the appendices are a single and integral part of the dissertation work.

- ❖ First preliminary experiment - creating and structuring the methodology of the educational module.
- ❖ First main experiment - theoretical product of teaching activity.
- ❖ Second preliminary experiment - establishing modern trends in general education programs for a healthy lifestyle and sports (Wellness) in the Bulgarian School.

- ❖ Second main experiment - improved the system, objectifying the functional preparation of the pedagogical process.
- ❖ Third preliminary experiment - selection of modern specialized tools for managing functional dynamics, application of innovative methods and applications for wellness competence
- ❖ A third main experiment perfects the system, introducing functional levels in the pedagogical process of Culture for a healthy lifestyle (Wellness).

The three main experiments comprehensively improve the Healthy Lifestyle and Sports (Wellness) system in the Bulgarian School and objectify its management through the subject of physical education and sports, applying innovative methods and applications for wellness competence.

## **Chapter Three**

### **III. Scientific-applied and methodical aspects of motor potential**

#### **III.1. Summarizing the experience of the management of learning in preschool and primary school stage**

Promoting the health and well-being of students by providing health kindergarten through fourth grade and building motor skills are the main motivations in modern preschool and elementary school wellness.

The dissertation work sets the goals of logistical confirmation of the original research, variability in improving the motor capacity and academic achievements of the children (which, in the course of the present work, was found to be directly dependent), as well as exploring possibilities for developing a new project - Curriculum related to the implementation of Wellness in the Bulgarian school.

Recommendations related to the development of project-learning programs for health care, physical activity and Healthy lifestyle and sport (Wellness)

When developing a curriculum related to Healthy Lifestyle and Sport (Wellness), the key findings of the WHO meta-analysis of promising practices in health promotion in schools should be taken into account. The findings offer valuable information about strategies leading to measurable outcomes in knowledge, skills, attitudes and behaviors – directly related to a healthy and active lifestyle.

Analysis of indicators, functional control and assessment - results obtained - 1st main experiment /appendix 5, page 82/.

Analyzing the results in the two cognitive levels of the conducted experimental research, it was found: significant changes regarding improvement of motor activity in functional dynamics, of tracked learning indicators keen



attention, maintaining concentration and developing interest in the applied methodology of innovative yoga practices.

The results are due to the impact of the entire teaching-pedagogical process - visualized and presented in tables and figures. Measurement of short-term and coordination indicators - boys/girls /appendix 5, page 82, table 14/.

Static research methods – 1-st basic experiment. Hypothesis testing by Student's t-test - non-reciprocal samples.

Based on a quantitative and qualitative analysis of empirical data obtained during testing in the target groups, this involves proving a working hypothesis. According to her, the approved model of training, based on the application of the technology of specialized yoga-practices of a corrective nature, will lead to the improvement of the posture and prevention spinal distortions in preschool children. The empirical data were mathematically processed using Microsoft Excel statistical software packages. Results are presented as arithmetic mean and standard error ( $M \pm m$ ). The degree of significance of the differences between the values of the indicators before and after the experiment, in each target group, was determined by using the parametric Student's T-test. The difference will be considered significant at  $p \leq 0.05$ . This necessitates the initial formulation of two statistical hypotheses:

- Zero or working hypothesis ( $H_0$ ) - there is no statistically significant difference in the compared indicators. An artificial difference is observed in the samples, it is random and cannot be generalized for the general population.
- Alternative hypothesis ( $H_1$ ) - the observed difference in empirical data is statistically reliable and can be generalized for the general population.

The static hypotheses receive the following formulations:

$H_0$  – improvement of body posture in EG is due to random factors.

$H_1$  – improvement of body posture in EG is due to the applied technology.

A statistically significant difference (correlation) due to specialized yoga practices is observed between the studied indicators in the two stages of the study.

For the verification of the hypothesis, there will be equal differences between mean values. According to this method, the null hypothesis is accepted or rejected depending on the obtained difference:  $H_0$ : if  $\bar{x}_0 = x$ ;  $H_1$ : if  $\bar{x}_0 \neq x$ .

The testing of the hypotheses is carried out using the Student's T-test.

$X_i$  – number of seconds

$\bar{X}_{1,2}$  – mean values in check. for the samples (index 1 - EG, index 2 - CG).

$\sigma_{1,2}^2$  – sample variances

$n_{1,2}$  – sample size

Dispersion – determined by formula:

$$\sigma^2 = \frac{\sum_1^n (X_i - \bar{X})^2}{n - 1}$$

Applying the Student's test for equating results in two independent samples of different volume,  $t$  ce determines the relationship:

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{(n_1 - 1)\sigma_1^2 + (n_2 - 1)\sigma_2^2}{n_1 + n_2 - 2}}} \cdot \sqrt{\frac{n_1 n_2}{n_1 + n_2}}$$

Degrees of freedom  $f = n_1 + n_2 - 2$  the samples are slightly different. From the Student table, we take the exact values  $t_{\alpha}$ . criterion for the corresponding samples. For the sample, the statistical confidence level is 95% and the error rate  $\alpha = 5\%$ , the value of  $t_{\alpha} = 2.045$ . If  $t_{iz} < t_{\alpha}$ , it accepts  $H_0$  as true. If  $t_{iz} > t_{\alpha}$ , then  $H_1$  is accepted as true.

A specified level of statistical significance in educational research is 0.05 or 5%. The drawn conclusion is with 95% certainty - information on theoretical values for the *Student's t-criterion*.

Statistical data for testing the hypothesis were read from:  
<http://www.socscistatistics.com/tests/studentttest/default2.aspx/>

Values  $t = 6.99$  and  $p < .00001$ . The result is significant  $p < .05$ .  $t_{\text{test}} = 6.99$ ,  $t_{\alpha} = 2.045$  i.e.  $6.995 > 2.045$  – reliability of  $H_1$

It can be concluded that the increased values for the studied indicators compared to the results of the experimental group are due to the applied innovative methodology of adapted yoga practice tics, as the influence of external factors in the preparation of the results in the experimental group.

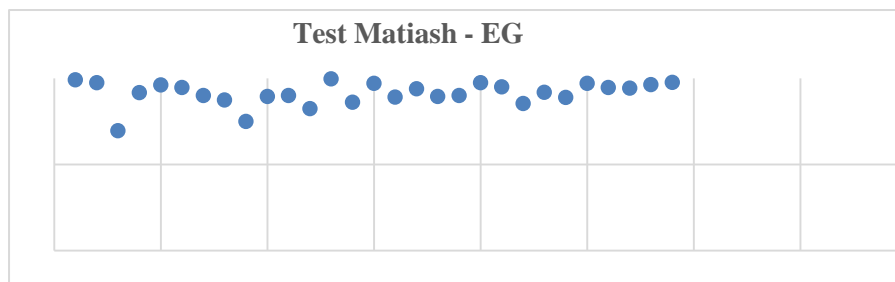
Diagrams of dispersion and determine correlation coefficients.

The study also analyzes the correlation between results in CG and EG. Data from the following variables were used, tracked in two cognitive stages:

- X - EG - results start
- Y - EG - results end

Before calculating and analyzing a correlation coefficient, a scatterplot will be prepared and analyzed, which will visually show the shape and magnitude. The form of the correlation was determined by regression analysis.

The dispersion diagram of the solution, in which the independent variable X, /beginning - EG/, is scaled along the abscissa in the solutions, and the dependent variable along the ordinate - values a Y, /end - EG/.



**Figure 18.** *Dispersion of variables - test Matiash EG*

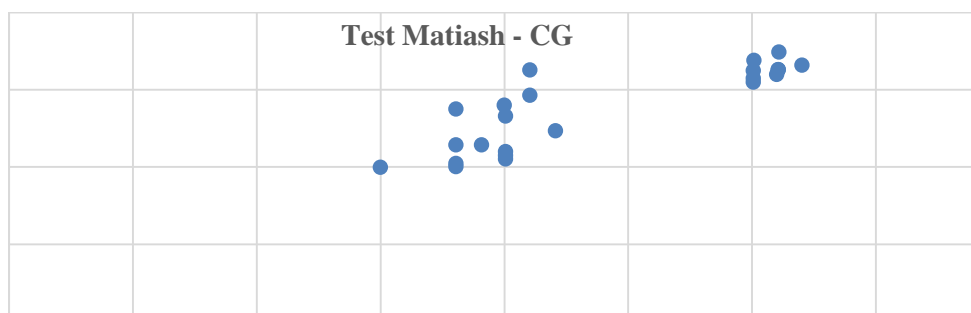
It can be seen from the above dispersion diagram that there is a moderate correlation between the variables X and Y,  $R_f = 0.31$ . The two tracked variables differ moderately.

The correlation dependence was determined by Fechner's coefficient according to the formula:

$$R_f = \frac{a.d - b.c}{\sqrt{(a+b).(c+d).(a+c).(b+d)}} = 0,31$$

- a - number of children with low values - start and high values - end
- b – number of children with high values - start and high values - end
- c – number of children with high values - start and low values - end
- d - number of children with low values - beginning and low values - end

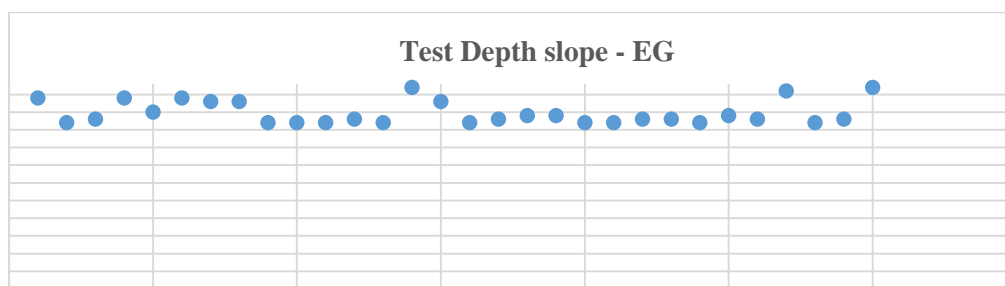
The obtained values for the Fechner's coefficient indicate a moderate correlation between the results - Matiash test - start/end – EG - figure 18.



**Figure 19.** *Dispersion of variables - test Matiash CG*

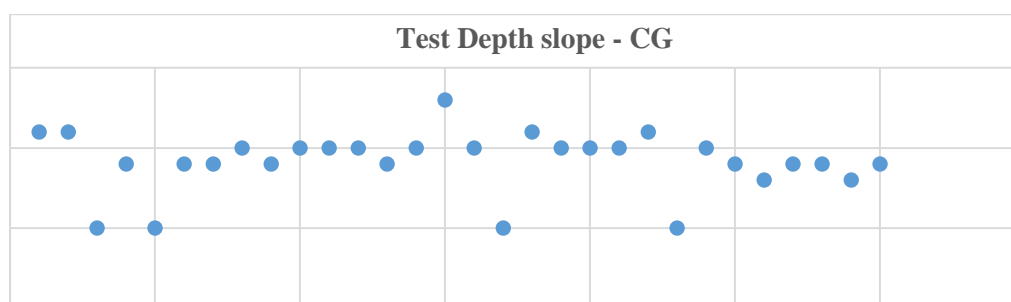
From the above-explained dispersion diagram, it can be seen that there is a weak correlation between the variables X and Y,  $R_f = 0.24$ , and the established

dependence is due to frequent illnesses and gaps in the regular influence of the complexes of yoga practices - figure 19.



**Figure 20.** *Dispersion of variables – test Depth Slope EG*

In the dispersion diagram described above,  $R_f = 0.37$  is found, which is related to the test - Depth slope due to the ontogenetic development in this age period - figure 20.



**Figure 21.** *Dispersion of variables – test Depth Slope CG*

From the above-explained dispersion diagram, it is found that  $R_f = 0.29$  is a weak correlation dependence between slope depth, due to frequent absences for health reasons - figure 21.

Variance analysis  $V\%$  - provides information on dispersion and comparing variability in traits. Used to determine sample homogeneity:

- Homogeneous / uniform / sample - dispersion - small, up to 10-12 %;
- Between 10-30% - approximate uniformity;
- Above 30% - high dispersion in the sign - non-uniformity of the sample.

Testing hypotheses about a difference between the means of two dependent samples. Examining two different states for the same objects, the *Student t-Test* and the capabilities of the program were used to test a hypothesis:

*Excel - Data - Data Analysis - t-Test: Paired Two Samples for Means.*

For statistical correctness, test results are analyzed, which are confirmed with the required guarantee probability (95% significance; 5% probability of error).

**Table 47.** *Dynamic in the indicators - motor qualities – boys*

Nº	Indicators	Beginning	End	t <sub>emp</sub>	t <sub>teor</sub>
1	Running 50 m.	1,3	2,2	-7,4162	1,7958
2	Long jump from a standing position	2,5	2,5	0	1,7958
3	Throwing a solid ball	1,4	2,1	-4,6904	1,7958
4	Running 200 m.	1,5	2	-3,3166	1,7958

$$t_{\text{emp}} = \frac{\bar{d}}{\sqrt{\frac{\sum d^2 - n\bar{d}^2}{n^2 - n}}} \quad \text{at } \alpha=0.05 \quad \text{and } df=11 \quad (\text{degree of freedom})$$

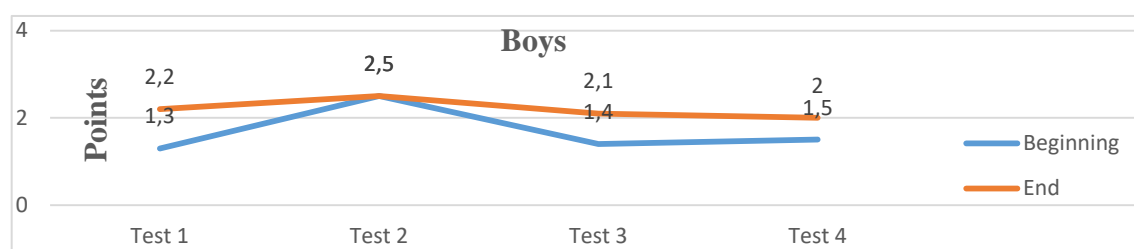
$$H_0: \mu_1 - \mu_2 = 0 \text{ и } H_a: \mu_1 - \mu_2 < 0$$

Empirical values are calculated from sample data. The theoretical (critical) value is a constant quantity and is found in standard theoretical distribution tables at a predetermined significance level of 95% and a certain degree of freedom  $df=11$ . Comparing a tabular (critical) value of the criterion with the empirical one gives reason to conclude which of the hypotheses is true.

Test - running 50m reveals sprint capabilities. It is limited by speed of reaction, speed of individual movement, small resistance and frequency of movements - amplitude. Diagnosing a complex manifestation of speed motor quality. The test statistic  $t_{\text{emp}} = -7.4162 < 1.7958$  (critical value in a one-sided test), therefore  $H_0$  is rejected in favor of  $H_1$  at  $\alpha=0.05$ . The registered increase is due to the impact of the applied methodology. The two tests are highly correlated

(relationship - speed and explosive power lower limbs). At a jump - insignificant increase - results in test statistics  $t_{\text{emp}} = 0$ , therefore  $H_0$  is confirmed. The registered increase is random and is due only to biological factors in the development of motor quality speed /boys/.

When measuring the explosive force of the upper limbs with a test: throwing a ball 1 kg., the throwing distance increased and the results of the test statistic  $t_{\text{emp}} = -4.6904 < 1.7958$  (the critical value - one-sided test), therefore  $H_0$  is rejected and confirms  $H_1$ . The average indicator of strength endurance at the end of the experiment also increased:  $t_{\text{emp}} = -3.3166 < 1.7958$ ,  $H_0$  is rejected in favor of  $H_1$  at  $\alpha=0.05$ . Test results confirmed with the required assurance probability (95% significance; 5% probability of error) were analyzed for statistical correctness.



**Figure 23.** *Dynamic in the indicators - motor qualities – boys*

The indicators characterizing the motor qualities of the girls are presented in table 48.

**Table 48.** *Dynamic in the indicators - motor qualities – girls*

№	Indicators	Beginning	End	$t_{\text{emp}}$	$t_{\text{teor}}$
1	Running 50 m.	1,2	2	-5,07808	1,7709
2	Long jump from a standing position	2	2,4	-2,68742	1,7709
3	Throwing a solid ball	1,6	1,9	-1,88294	1,7709
4	Running 200 m.	1,6	1,9	-2,28035	1,7709

$$t_{\text{emp}} = \frac{\bar{d}}{\sqrt{\frac{\sum d^2 - n\bar{d}^2}{n^2 - n}}}$$

at  $\alpha=0.05$  and  $df=13$  (degree of freedom)

The calculations were carried out using the program:

*Excel - Data - Data Analysis - t-Test: Paired Two Sample for Means.*

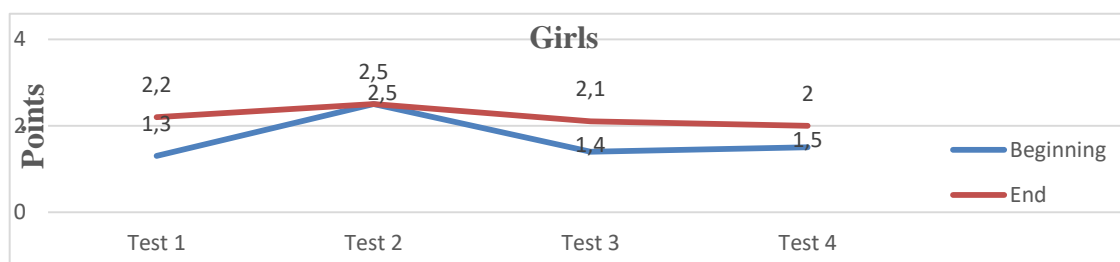
In girls, the studied age period has a less pronounced sensitivity regarding the development of motor qualities. The registered increase is due to both biological factors and the impact of applied innovative methodology.

Test - running 50m, dynamics in the changes are similar /boys/. The difference at the end of the experiment is significant  $t_{\text{emp}} = -5.0780 < 1.7709$ , therefore reject  $H_0$  and confirm  $H_1$ .

Test - long jump from place, an increase is observed - statistically significant  $t_{\text{emp}} = -2.6874 < 1.7709$  (critical value - one-sided test),  $H_0$  is rejected,  $H_1$  is confirmed at  $\alpha=0.05$ .

Tests - throwing a ball 1 kg and running 200 m., the increase at the end is the same. The result is statistically significant, both for the explosive power of the upper limbs:  $t_{\text{emp}} = -1.8829 < 1.7709$  (critical value - one-sided test), and for power endurance:  $t_{\text{emp}} = -2.28035 < 1.770933$ .

Both tests reject  $H_0$  Hypothesis and confirm  $H_1$  hypothesis.



**Figure 24.** *Dynamic in the indicators - motor qualities – girls*

The obtained results of the study of motor qualities give grounds for generalization - the motor activity improves at the end of the observed period. A quantitative increase was found for most indicators, more pronounced in boys than in girls, due to the applied innovative methodology.



Table 48.

*Dynamic in the indicators - motor qualities*

№	Motor dynamics	Beginning	End	t <sub>emp</sub>	t <sub>teor</sub>
1	Boys	1,7	2,2	-6,1412	1,7958
2	Girls	1,6	2	-7,77091	1,7709

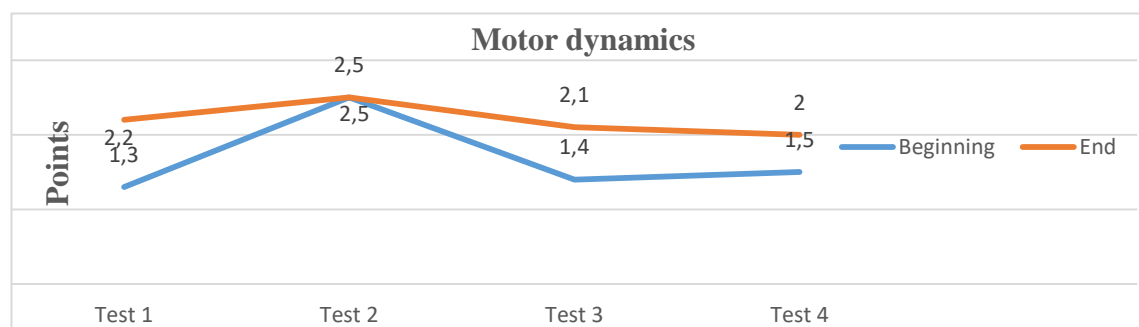
$$t_{\text{emp}} = \frac{\bar{d}}{\sqrt{\frac{\sum d^2 - n\bar{d}^2}{n^2 - n}}}$$

at  $\alpha=0.05$  and  $df=25$  (degree of freedom)

$$H_0: \mu_1 - \mu_2 = 0 \text{ и } H_a: \mu_1 - \mu_2 < 0$$

The empirical value is calculated from sample data. The theoretical (critical) value is a constant quantity and is found in standard theoretical distribution tables at a predetermined significance level of 95% and a specified degree of freedom  $df=25$ . For this purpose, the tabular value of the criterion is compared with the empirical one. The results are statistically significant, for boys  $t_{\text{emp}} = -6.1412 < 1.7958$ . For girls,  $t_{\text{emp}} = -7.7709 < 1.7709$ . In both gender the alternative hypothesis is confirmed at  $\alpha=0.05$ . Evidence of effectiveness in applied innovative methodology. An increase in attentional stability is noted.

Figure 25.

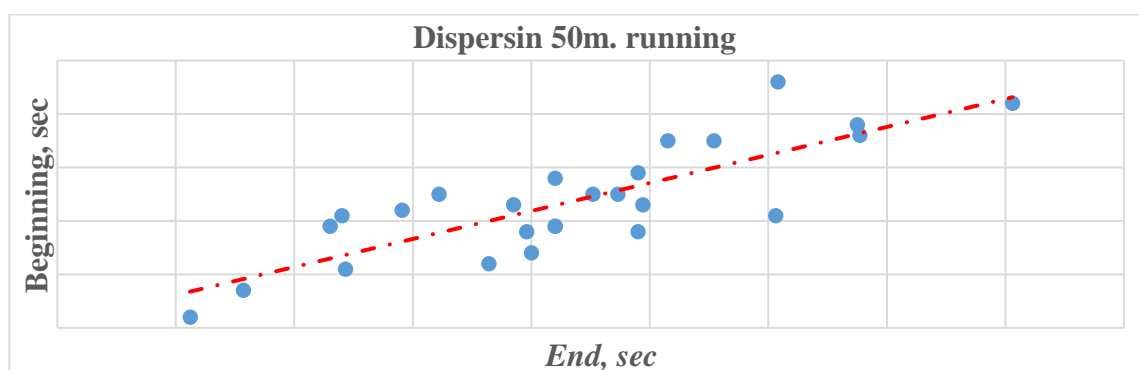
*Dynamic in the indicators - motor qualities**Fechner's correlation coefficient - beginning/end*

The study analyzed correlation between motor capacity scores and test 2 scores.

Data from the following variables are used:

- X - mastered motor skills /beginning/
- Y - academic achievements /end/

A rank correlation coefficient significance table was used to test correlation coefficient significance. Error 0.05  $r_{\text{theor}} = 1.96$ .



*Excel-Data - Data Analysis – Correlation*

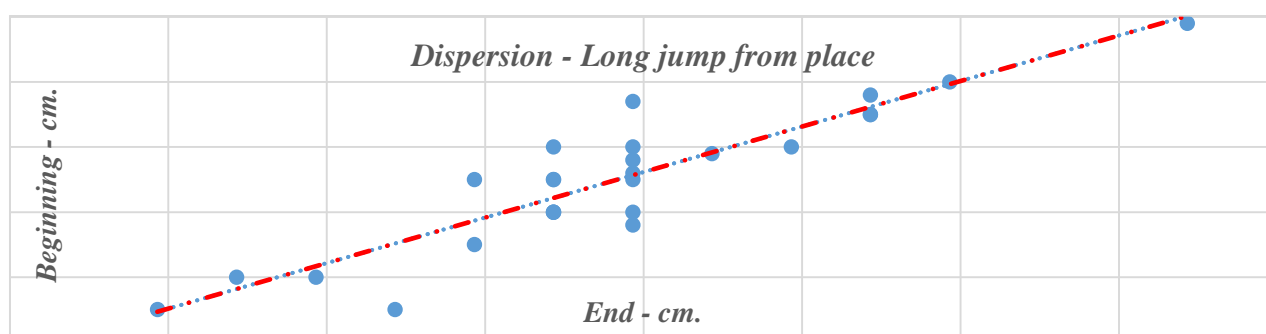
**Figure 26.** *Distribution of variables - Test 1 - beginning/end*

From the reference values  $R_f=0.54$ , a significant linear correlation was found, a clear distinction in the two studied variables /figure 26/.

Determination of correlation dependence - Fechner coefficient by formula:

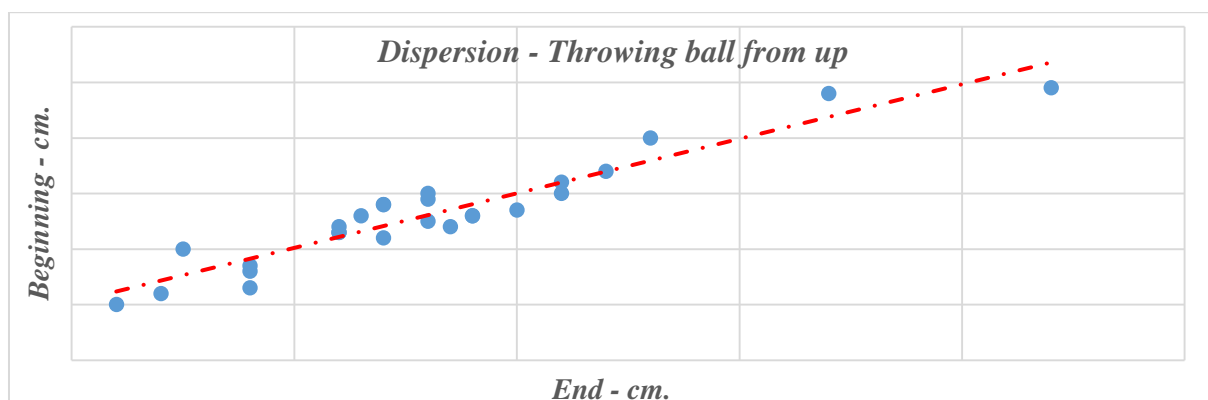
$$R_f = \frac{a.d-b.c}{\sqrt{(a+b)(c+d)(a+c)(b+d)}} = 0.54$$

The obtained values of the Fechner coefficient indicate a moderate correlation dependence between mastered motor skills and academic achievements. A moderate distinction between the two studied dependencies is observed, due to the applied technology.



**Figure 27.** *Distribution of variables - Test 2 - beginning/end*

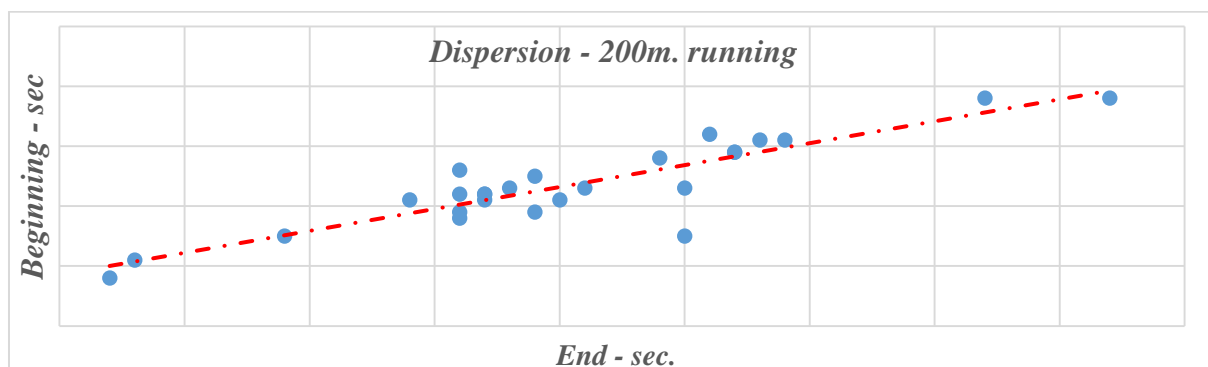
From the reference values  $R_f=0.54$ , there is a significant linear correlation - the tracked variables differ significantly /figure 27/.



*Excel–Data - Data Analysis – Correlation*

**Figure 28.** *Distribution of variables - Test 3 - beginning/end*

Based on reference values,  $R_f=0.35$ , there is a moderate linear correlation /figure 28/.

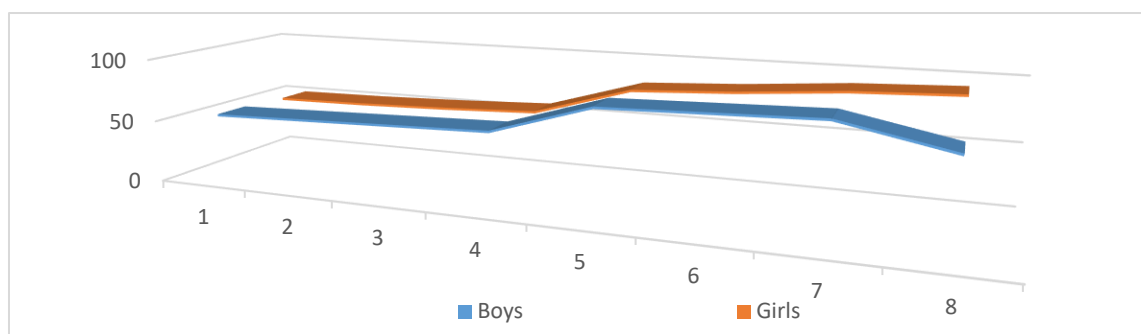


*Excel–Data - Data Analysis – Correlation*

**Figure 29.** *Distribution of variables - Test 4 - beginning/end*

Based on reference values,  $R_f=0.60$ , there is a significant linear correlation /figure 29/.

Analysis - Combined results obtained from conducting – 2-nd main experiment / appendix 2, table 10 and 11, pp. 34 and 35/.



**Figure 30.** *Chest circumference /cm/*

Moderate growth was found in the chest /figure 30/. Indicator - chest circumference and both genders at the age of 7-10 years. The chest circumference Increase , starting from a difference of 1 cm in 7 years and reached a difference of 2.1 cm. for 9 years, coefficient of variation below the critical - 4.5%-6.8%. The results give reason to substantiate a regularity in the development of the thorax, which is important for increasing functional capabilities / appendix 2, page 45, table 56/.

The results of a comparative analysis of average growth of anthropometric indicators are reflected in table 57.

**Table 57.** *Average growth - anthropometric indicators*

<b>Height</b>	<b>10,3</b>	<b>10,6</b>
<b>Body mass</b>	<b>24,9</b>	<b>27,4</b>
<b>Chest circumference</b>	<b>13,4</b>	<b>15,1</b>
<b>Average relative growth</b>	<b>16,2</b>	<b>17,6</b>

Motor development, expressed by signs of height, body mass and chest girth, proceeds evenly with a pronounced increase with increasing age. The differences between boys and girls are not significant.

The observed minimum excess for all ages in chest circumference and for some ages in body mass in girls is a natural motor development.

Relatively stable values are found for the three main anthropometric indicators /table 57/.

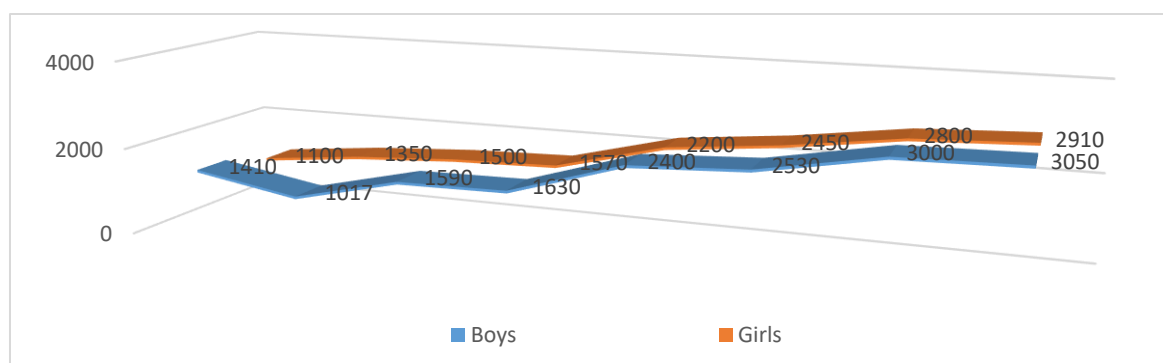
Variation coefficient in the range of 5-9%, more pronounced in girls, which can be explained by acceleration processes /table 58/.

**Table 58.** *Comparative results in the indicators - boys/girls*

Indicators	Boys	Girls	d-7	Boys	Girls	d-8	Boys	Girls	d-9	Boys	Girls	d-10
Height	126,1	124	2,1	131,3	130,3	1	136,3	136	0,3	140,3	140,1	0,2
Body mass	27,4	24,9	2,4	29,6	27,8	1,8	31,9	30,7	1,2	34,6	34,4	0,2
Chest circumference	63,1	60,4	1,6	66,6	64,8	1,8	69,0	67,9	1,1	70,2	71,2	1
Vital capacity	1814	1558	256	1967	1767	200	2206	2136	70	2350	2266	84
Right hand power	14,5	13,3	1,2	16,3	14,7	1,6	18,6	15,9	2,7	19,5	17,4	2,1
Left hand power	12,9	12,4	0,5	14,3	13,7	0,6	17	14,9	2,1	19,3	15,9	3,4
Static force	36,5	30,8	5,7	43,6	36,2	7,4	15,1	40,1	14,4	51,1	14,3	8,8
40 m. running	8,3	8,8	0,5	8,1	8,5	0,5	78	8,2	0,4	7,7	8	0,3
200m. running	47,9	50,5	2,6	44,7	47,3	2,7	42,8	44,8	2,1	40,7	46,8	3,8
Long jump - place	133,6	118,3	15,3	140,7	128,6	12,1	145,8	136,6	9,2	146,3	137	9,3
Long jump - boost	208,4	169,7	13,7	252,3	192,5	59,8	281,2	213	68,2	299,7	225,6	74,1
High jump	18,5	16,3	2,2	21,2	29,3	1,9	24	21,5	2,5	24,9	22,8	2,1
Thr.ball 150g.	16,8	8,8	7,9	21,3	9,5	7,4	24	13,1	10,9	27,1	15,3	11,7
Thr.ball 1kg.	4	3,5	0,4	4,8	4	0,8	5	4 , 7	0,3	5,5	8,9	0,6
Speed dv. reaction	247,5	279,1	31,6	246,8	268,9	22,1	227,5	256	28,5	203	247,3	44,3
Emotion sustain.	24,7	22,6	2,1	22,6	20,5	2,1	20,6	18,6	2	18,3	16,9	1,4
Max. frequency d.	27,7	27,5	0,2	31,8	29,8	2	37,1	34,5	2,6	40,5	37,3	3,2

### *Dynamics – physio-metric indicators*

In dynamics, the living capacity indicator - significantly increased values were registered / figure 31, appendix 2, table 59, page 45/.

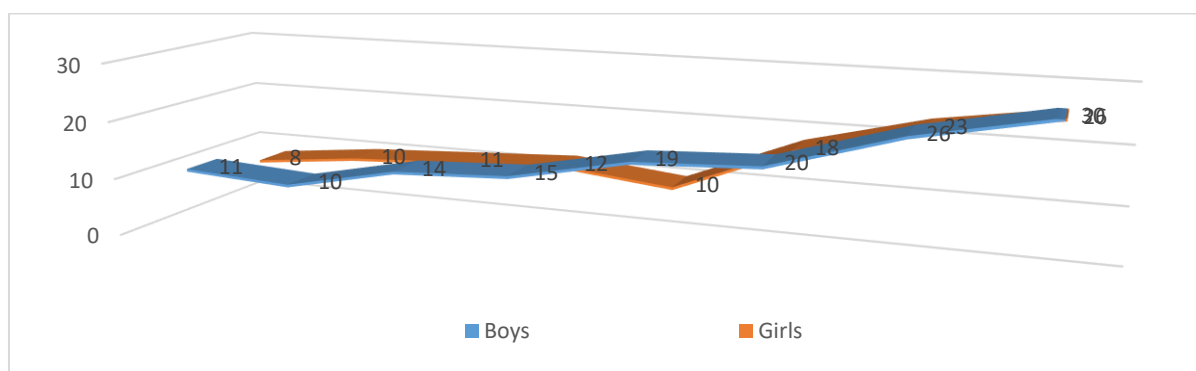


**Figure 31.** *Vital capacity - cm<sup>3</sup>*

In boys, an increase in vital capacity is outlined with average values for 1-st grade - 1814 cm<sup>3</sup>, 2-nd grade - 1967cm<sup>3</sup>, 3-rd grade - 2206 cm<sup>3</sup>, and 4-th grade – 2350 cm<sup>3</sup>. The total increase is 542 cm<sup>3</sup>, (28.6 %).

The dynamics of this indicator in girls: total growth 689 cm<sup>3</sup>, (48.1%). Variation coefficient is in the range of 15-20%. Boys are distinguished by higher values of vital capacity than girls. As age increases, the difference between the two target groups gradually decreases. For the studied period, girls 45.4% have a much higher percentage increase than boys 29.5%. We assume that the acceleration and increase in motor capacity had a beneficial effect on the development of this physio-metric indicator in girls, compensating for the lag in the preschool period compared to boys.

Static strength of upper limbs - increases evenly throughout the studied period /appendix 2, tables 60 and 61, pages 45 and 46/.

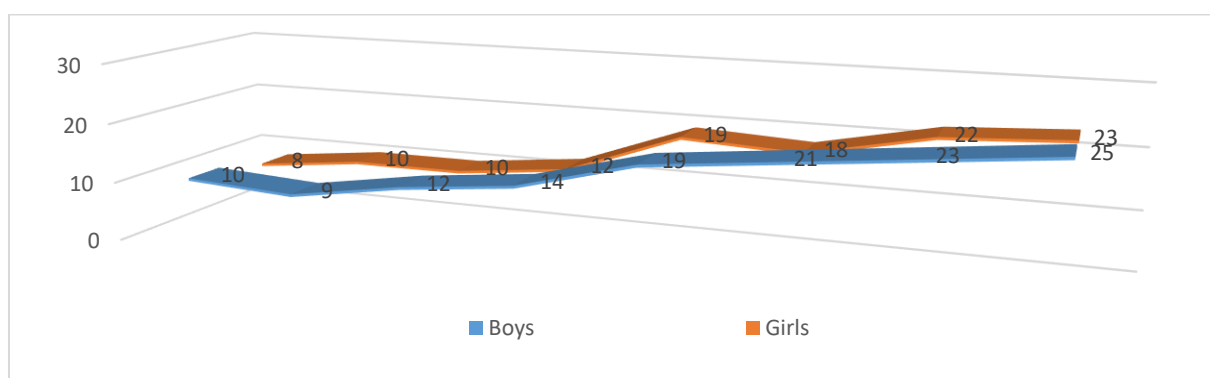


**Figure 32.** *Strength right hand - kg.*

Growth in the strength of the right hand in boys starts from 14.5 kg. – 1-st class and up to 19.5 kg. – 4-th grade. For girls, these values are 13.3 kg. and 17.4 kg. The difference in static right-hand strength between girls and boys remained almost unchanged for the entire studied period. For the left hand, it shows an upward trend. The increased difference can be explained by increasing the functional asymmetry of the upper limbs with age. The situation is similar for girls.

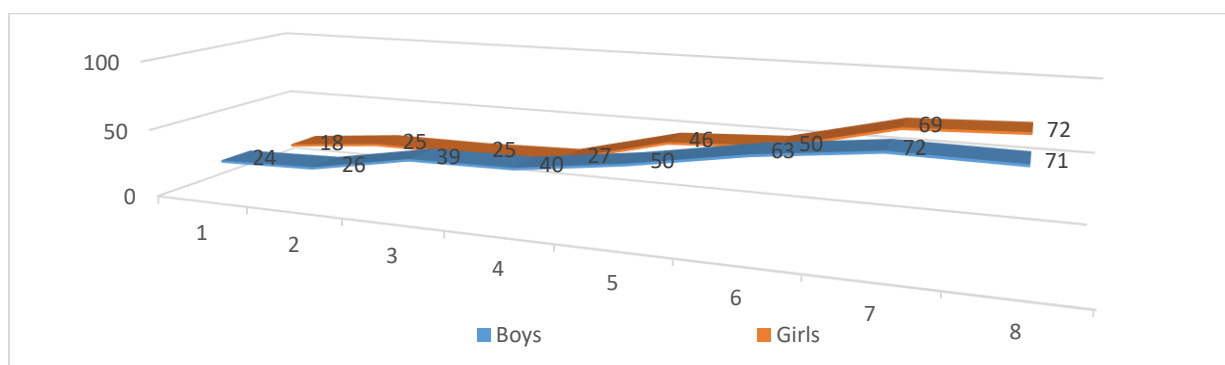
Comparing the achievements of boys and girls, the following trend is observed: with increasing age, the difference between the absolute values of this indicator also increases. The difference is especially pronounced in the 3-rd grade, when girls lag behind boys by 2.7 kg. for right hand and with 2.1 kg. for left hand / figure 32; figure 33/.

The coefficient of variation also increased with increasing age from 14% to 21%, being slightly higher in boys. The overall increase in boys is higher than in girls. The increment for the right hand is higher than that for the left. The situation is similar for girls.



**Figure 33.** *Strength left hand - kg.*

The results obtained are the result of purposeful work to develop arm and shoulder girdle strength. There are no studies in the studied literature with which we could more objectively compare the obtained data. With increasing age, the dynamics of standing strength marks a regular upward development of strength capabilities / figure 34, appendix 2, table 62, page 46/.



**Figure 34.**

**Static force - kg.**

Boys - increase from 36.5 kg. to 55.1 kg, girls from 30.8 kg. to 42.3 kg.  
Total growth: boys -19 kg.; 50.6%, girls - 12.9 kg.; 38.8%.

Standing strength - girls are gradually falling behind boys. If in the 1-st grade they are behind the boys by 5.7 kg, then in the 2-nd grade the difference increases to 7.4 kg, and in the 3-rd grade it is 14.4 kg. Both sexes have approximately the same increase, with a slight preponderance of girls of 3%.

Results - benchmarking-analysis average relative growth of physio-metric signs /table 63/.

**Table 63.**

**Average relative growth - percentage ratio**

<b>Gender</b>	<b>Boys</b>	<b>Girls</b>
<b>Indicators</b>	<b>%</b>	<b>%</b>
<b>Vital capacity</b>	<b>29,5</b>	<b>45,4</b>
<b>Strength right hand</b>	<b>34,5</b>	<b>30,8</b>
<b>Strength left hand</b>	<b>49,6</b>	<b>41,1</b>
<b>Static force</b>	<b>40</b>	<b>37,3</b>
<b>Average relative growth</b>	<b>38,4</b>	<b>38,6</b>

The close values show that the motor load is adequate and affects the two target groups relatively equally.

We can summarize the obtained results:

- The main physio-metric signs grow relatively evenly for both genders.
- The differences between the two genders are clearly outlined.

As a result of benchmarking-analysis of data from the studied neuro-psycho parameters, it can be summarized:

- Neuro-psycho reactivity, expressed by signs: speed of simple motor reaction, emotional resistance and maximum frequency of movements, naturally increase with increasing age.



- Boys have better results in tests of speed of simple motor response and maximum frequency of movements.
- Girls report better results at all ages on the indicator - emotional resilience.

Establishing interdependencies between indicators of motor development and motor activity

The analysis of literary sources shows that there is a certain dependence between motor development and individual indicators of motor activity. Research covers mostly the pubertal and post-pubertal age and relatively little early stage.

Correlation coefficients: anthropometric and physiological indicators, motor development and motor activity - tables 76 and 77.

**Table 76.** *Correlation coefficients - height / other indicators*

<b>Gender</b>	<b>Boys</b>			<b>Girls</b>		
<b>Indicators by classes</b>	<b>1st grade</b>	<b>2nd grade</b>	<b>3rd grade</b>	<b>1st grade</b>	<b>2nd grade</b>	<b>3rd grade</b>
<b>Body mass</b>	738	716	656	747	764	684
<b>Chest circumference</b>	600	525	490	567	493	561
<b>Vital capacity</b>	692	652	484	508	434	620
<b>Right hand power</b>	471	470	536	530	442	574
<b>Left hand power</b>	483	383	576	588	392	514
<b>Static force</b>	206	296	444	171	244	260
<b>40 m. running</b>	205	205	162	98	316	63
<b>200m. running</b>	77	130	356	173	225	427
<b>Long jump - place place</b>	92	67	154	410	106	397
<b>Long jump - boost</b>	533	471	207	278	217	154
<b>High jump</b>	285	285	384	118	382	250
<b>Thr.ball 150g.</b>	366	398	395	324	487	233
<b>Thr.ball 1kg.</b>	336	447	405	391	449	310

*The data is multiplied by 10<sup>3</sup>*

There is a weak to moderate and significant correlation between the results from the tests. The trend is towards a decrease at the end of the studied period. The lower the age, the more integrally the structural-building components of the motor capacity are manifested, clearly delineating the presence of a Wellness culture in the Bulgarian school. Correlational dependences - tests: jump length, motor qualities, neuro-psychic reactivity and tenso-metric parameters. We will consider aspects in the interdependence of the results of: long jump from a place

with strengthening with the studied indicators. To achieve good motor training, the optimal ratio between developing motor qualities and building motor habits is important. Results: the correlation analysis for the relationship between the tracked indicators and the jump length from a place, /table 78/.

**Table 78. Correlation - jump length from place / other indicators**

Gender	Boys			Girls		
Indicators by classes	1st grade	2nd grade	3rd grade	1st grade	2nd grade	3rd grade
40 m. running	505	545	580	431	635	647
200m. running	601	641	401	292	503	720
Long jump - boost	650	621	584	369	614	576
High jump	545	514	564	393	359	341
Thr.ball 150g.	370	360	405	69	78	395
Thr.ball 1kg.	575	480	467	365	368	607
Rapidity of r-tion	36	189	430	210	199	119
Emotional resilience	245	240	298	241	19	320
Max. motion frequency	118	268	312	31	55	14
F average	262	229	162	217	221	57
F max.	462	320	357	278	359	143
I	262	262	109	263	150	183

*The data is multiplied by 10<sup>3</sup>*

The indicators of motor activity show a weak to significant dependence in the achievement of JLP<sup>8</sup>. A moderate dependence on the 40 m. results was found. Running  $r=0.45$  - 7 years and shows an upward trend to significant  $r=0.58$  - 9 years boys. Girls - similar situation visualized in table 78, figure 47. The established significant dependence between JLP and 200 m. running, confirms complexity in development.

**Table 80. Correlation dependencies between the studied indicators – 1-st grade - Boys**

Vital capacity		389	240	162	169	141	70	225	191	76	132	154	54	71
Right hand power	118		776	676	613	420	393	322	433	334	432	44	34	172
Left hand power	213	683		510	483	267	367	550	536	274	412	211	92	118
Static force	226	283	49		505	239	136	139	390	212.	214	247	74	299
40 m. running	116	166	183	187		369	515	359	682	357	453	136	317	212
200m. running	93	234	210	232	468		500	526	186	266	411	292	558	221
Jump Length from Place	220	321	271	460	431	292		620	555	340	545	34	245	118
Long jump - boost	285	395	241	351	239	264	369		420	499	550	62	160	10
High jump	180	240	301	97	240	449	393	375		334	400	9	161	102
Thr.ball 150g.	204	475	322	271	175	128	69	361	252		578	178	114	206
Thr.ball 1kg.	150	411	346	180	117	264	365	391	173	516		15	295	236
Rapidity of r-tion	21	058	127	129	129	246	210	134	102	490	256		298	250
Emotional resilience	39	273	316	309	392	65	241	307	117	76	151	283		427
Max.motion frequency	0	174	272	199	234	27	31	90	66	175	132	228	3	

**Table 81. Correlational dependencies - studied indicators – 1-st grade - Girls**

<sup>8</sup> JLP - Jump Length from Place

**Table 82. Correlation dependencies between the studied indicators – 2-nd grade - Boys**

Correlation coefficient	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14
Vital capacity		101	129	356	232	352	92	261	384	351	326	93	214	121
Right hand power	217		793	344	79	199	73	122	34	379	103	235	302	11
Left hand power	198	793		337	132	55	87	94	16	215	132	46	127	78
Static force	426	495	233		90	374	2	167	330	346	330	16	401	223
40 m. running	223	123	32	559		568	494	599	485	281	246	224	146	200
200m. running	408	4	47	469	664		364	568	263	362	360	12	60	117
Jump Length from Place	42	173	144	439	635	503		413	364	47	389	67	85	231
Long jump - boost	222	363	185	426	636	454	614		512	449	414	11	190	273
High jump	412	316	346	392	303	651	359	519		314	301	220	309	199
Thr.ball 150g.	675	301	189	518	288	388	79	394	486		363	326	9	388
Thr.ball 1kg.	545	74	92	545	399	519	368	346	340	733		342	201	43
Rapidity of r-tion	101	124	3	179	301	216	199	137	91	4	151		164	349
Emotional resilience	154	225	199	380	18	2	19	294	69	133	116	94		273
Max.motion frequency	159	18	1	34	162	274	55	230	332	36	124	137	25	

**Table 83. Correlation dependencies - studied indicators – 2-nd grade - Girls**

**Table 84. Correlation dependencies between the studied indicators – 3-th grade - Boys**

Vital capacity		349	432	422	10	277	201	89	77	332	368	187	291	178
Right hand power	344		688	576	230	129	288	366	278	579	605	128	181	230
Left hand power	391	702		679	131	172	83	332	294	440	485	85	319	96
Static force	411	300	448		201	136	333	464	206	537	725	268	363	90
40 m. running	113	202	81	475		491	580	427	486	472	327	201	398	424
200m. running	469	3	13	523	743		401	344	459	305	431	180	375	112
Jump Length from Place	128	85	99	607	647	720		614	564	405	467	430	298	312
Long jump - boost	21	328	207	330	579	543	576		471	627	549	205	61	340
High jump	46	25	26	11	509	554	341	599		323	318	290	297	424
Thr.ball 150g.	39	565	621	463	348	199	395	392	161		661	374	141	495
Thr.ball 1kg.	236	243		553	358	377	607	461	244	796		233	145	268
Rapidity of r-tion	10	20	133	153	213	297	119	170	329	68	32		137	238
Emotional resilience	121	44	59	89	173	132	320	251	349	6	104	152		393
Max.motion frequency	38	15	49	170	75	79	14	244	210	6	116	494	97	

**Table 85. Correlation dependencies - studied indicators – 3-th grade - Girls**

*The data is multiplied by 10<sup>3</sup>*

In the 2-nd main experiment, an measurement was conducted to test a pedagogical technology for the development of motor quality, agility and improvement of motor capacity of third grade students /9-10 years/. The purpose of the study was to establish and assess the presence of a Wellness culture by applying an innovative methodology for the development of motor quality, agility and development of motor potential by testing an innovative wellness methodology in the training of the PCS<sup>9</sup>, consisting of author's complexes of

<sup>9</sup> PCS - Physical Culture and Sport

motor exercises related to application of the Blaze-Pod Trainer application and checking its effectiveness in practice.

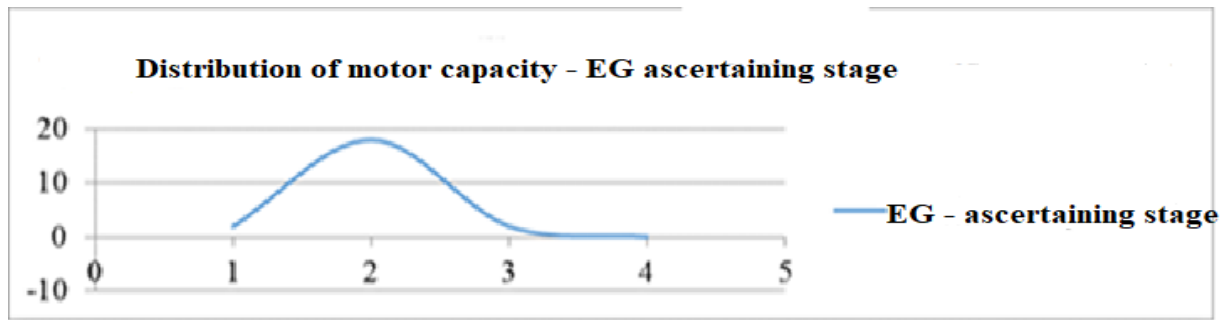
### *Discussion of obtained results*

The following is a benchmarking-analysis of test results in the ascertainment and control stage for motor capacity and motor quality agility. We note an improvement - the lowest score for motor quality agility of 0.52 sec. and a degradation of the highest Agility motor quality score of 0.23 sec. in CG. There is an improvement on the lowest score of 4.25 sec. and a 0.45 sec improvement in the highest Agility motor quality score in EG. No improvement in CG / tab. 86; app. 2, p. 49/. Grouping by motor capacity ratings and presenting empirical data in a secondary table. Relative frequency for percentage ratio when assessing motor capacity for ascertaining and control stage / table 87; appendix 2, page 50/.

Proof of the effectiveness of the applied technology for improving motor capacity in EG are the excellent results - 81.82%, compared to CG - 18.18% in the control stage.

After applying the author's complex in EG, they show a high level of development of motor quality agility - 68.18% - compared with 63.63% in the ascertaining stage, compared to a high level of development of motor quality agility - CG, found in the control stage - 50%. CG achieve a high level of development of motor quality agility - 73.33% from EG, who achieved a high level after an approved author's complex. The results show effectiveness in applied technology for the development of motor quality agility in 3rd grade students.

Moderate negative asymmetric distribution - motor capacity results /figure 51/. Based on the results of the analysis of variance, where  $\bar{x} < Me < Mo$  /table 92, appendix 2 – page 52/.



**Figure 51.** *Motor capacity level EG - ascertaining stage*

Finding: distribution of motor capacity level testing results from CG - finding stage is abnormal, 50% of all CG - finding stage results are in the interval  $\pm 12.18$ , which represents  $\frac{1}{2}$  tested by CG - finding stage /table 86; appendix 2, page 49/.

The coefficient of variation for test results for the level of motor capacity in the control stage in the EG after the approved author's complex is  $V=0.76\%$ , which indicates a normal distribution /table 92; appendix 2, page 52/. A statistically significant difference (dependency) was observed between the studied characteristics in the two stages, due to a proven author's complex of motor exercises.

Analysis - Summary of results obtained from the 3-rd main experiment - results of research work on determining motor capacity according to Eurofit.

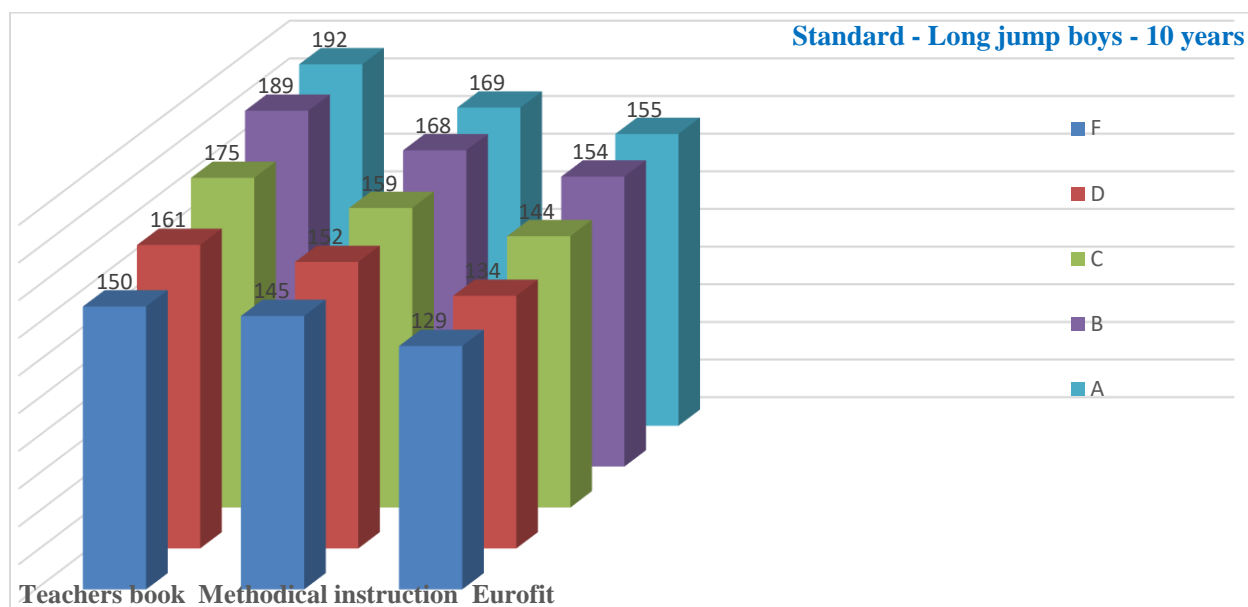
The Eurofit methodology has been introduced in the member states of the European Union in order to permanently control and evaluate fitness capabilities. Based on an integral assessment of motor abilities, adaptive capabilities, psycho-physical readiness and personal characteristics are indirectly evaluated.

*Benchmarking-analysis results - Eurofit test batteries. Comparing tests and results on both systems.*

**Table 103. Control and evaluation - motor activity by DOS<sup>10</sup> / requirements by Eurofit**

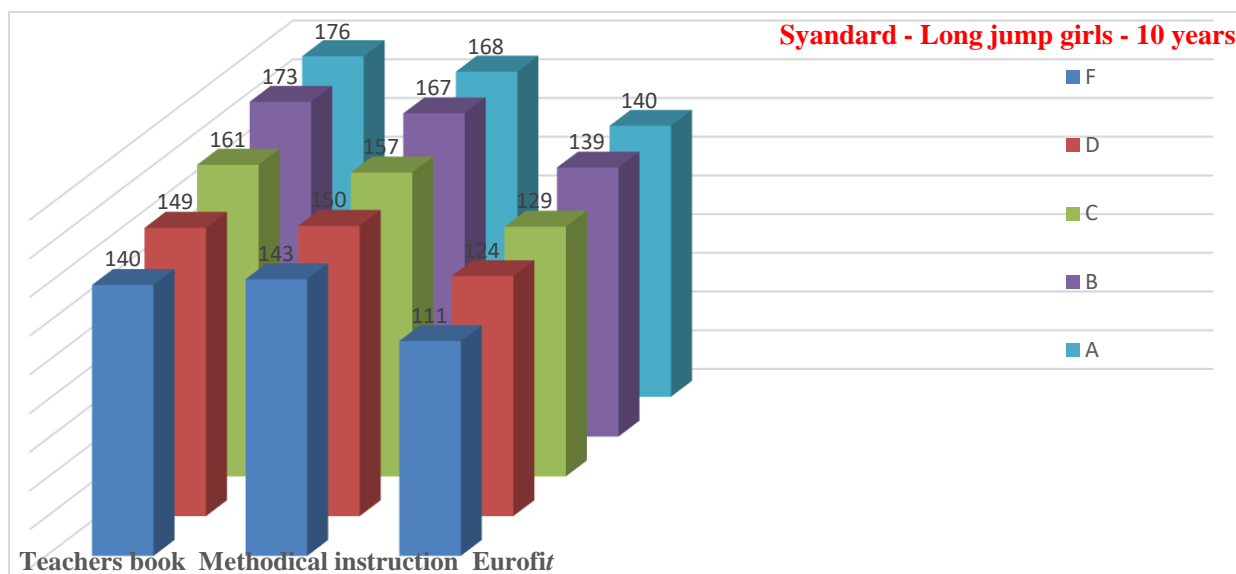
Motor qualities	Control and evaluation - motor activity by DOS	Requirements by Eurofit
Speed	50m running	Shuttle running – 10x5m
Agility	Agility test - loading of upper limbs	Tapping - test
Alacrity	Test - alacrity with load on lower limbs	Tapping - test
Explosive power lower limbs	Long jump from place	Long jump from place
Explosive power upper limbs	Throwing - solid ball with 2 hands /boys//	Dynamometer; Detention in high
General and speed endurance	Running: 300m/girls/; 600m/boys/; 200m/up to 4 grade/	Running for 90 sec.; 1.5 mile run
Equilibrium stability	-	Flamingo Test
Power Endurance	Lifting from the back lay - to dropping out /girls/	Lifting from the back lay - to dropping out /girls/
Speed Endurance	-	Lifting from the back lay for 30 sec.
Flexibility	-	Slope depth

Visually, figure 82 and figure 83 reflect the differences. The Bulgarian norm for 10-year-old boys is higher than the European one by 21-37 cm and by 29-36 cm for girls.



**Figure 82. Standard - assessment of long jump - boys 10 years**

<sup>10</sup> DOS - Darzhavni Obrazovatelni Standarti



**Figure 83.** *Standard - assessment of long jump - girls 10 years*

Analysis - survey among parents /appendix 3, page 70/.

The analysis of motor parameters allows the diagnosis of specific features in the development of motor potential in those who practice regular motor activities, establishing a lasting and constructive trend in the affirmation of wellness in preschool and school environments, which until now has not been registered in Bulgaria. It can be summarized that boys and girls are harmed by the high requirements of the currently valid normative evaluation tables. In the field of education, from an early age, motor skills are linked to academic competencies and achievements.

### **III.2. Theoretical modeling of the motor potential to achieve a culture for a healthy lifestyle (Wellness) in the Bulgarian school**

The recommended curricula in Healthy Lifestyle and Sports (Wellness) and the methodological tools for training and education of specialized personnel in Culture for Healthy Lifestyle and Sports (Wellness) also represent the emerging innovative educational technologies. Connecting specialist and non-specialist teachers through an online forum is a strategy to remediate and provide enhanced

support to teachers who do not have extensive training in the delivery of physical education or health programs at the pre-primary and primary stages of education. Schools and more specifically curricula related to health care, development of motor culture, career development and life skills have the potential to direct students to a healthy lifestyle and sports through the development of a Wellness culture in pre-school and school stages. Increasing the time and intensity devoted to teaching these curricula, using new strategies for their design and implementation, will provide schools with the opportunity to impact student health in a profound and lasting way. A healthy lifestyle (Wellness) in school can be integrated into the whole model of school learning in the school community, to strengthen the health and increase the success of students. Local wellness policies can address practices before, during, and after school, as well as grow into the family environment, establishing itself as a model of behavior.

Ongoing professional development and training is critical to supporting teachers in implementing new Wellness curricula and in implementing strategies that require new teaching and assessment skills. Wellness does not overlap with health. Health usually refers only to physical well-being, while wellness refers to the multidimensional interrelationship between motor, emotional, spiritual, intellectual, interpersonal, or socio-ecological aspects of life. It's a concept that expands and reaches beyond traditional ideas of fitness and health. A way of being that improves the quality of life.

A healthy lifestyle (Wellness) is a choice that provides vitality and energy in everyday life. Wellness is a state of well-being that enables the development, achievement and maintenance of personal potential in various aspects of life. It represents a constant process for emotional, mental, motor, social and spiritual development, well-being, allowing the maintenance of personal potential.



The modern school must accept the definition of wellness, integrating motor, mental, social, emotional-spiritual components of health into a meaningful whole - maximum health or overall health.

### **III.3. Individual and collective evaluations for monitoring motor potential in achieving a culture of healthy lifestyle (Wellness)**

The elements of the model for managing a specialized methodology in the education of a healthy lifestyle (Wellness) at school - remain unchanged throughout all groups, but the expectations of knowledge and skills change through the stages and classes, being upgraded and further developed.

In the present paper, we have developed programmatic guidelines to assist schools in promoting physical activity and healthy eating, building a systematic and coordinated approach to school health. Continuing education is essential for teachers and administrators committed to improving student health, academic success, and wellness.

Professional development provides opportunities for school staff to identify areas for improvement by learning and using proven practices, solving problems, developing skills, and practicing new strategies. In schools promoting a coordinated approach to health care, professional development should focus on developing leadership, communication, and collaboration skills.

The model proposed in this dissertation is an evolution of coordinated school health and provides a framework for dealing with the relationship between learning, as a cognitive process, and health based on the affirmation of a healthy lifestyle (Wellness) in school by increasing the well-being (well-being) of students.

Academic achievement is particularly related to physical activity, healthy and balanced nutrition, and chronic health conditions in a safe and positive school

environment. Although this connection is intuitive to many teachers, they see the effect of non-academic barriers to learning on a daily basis.

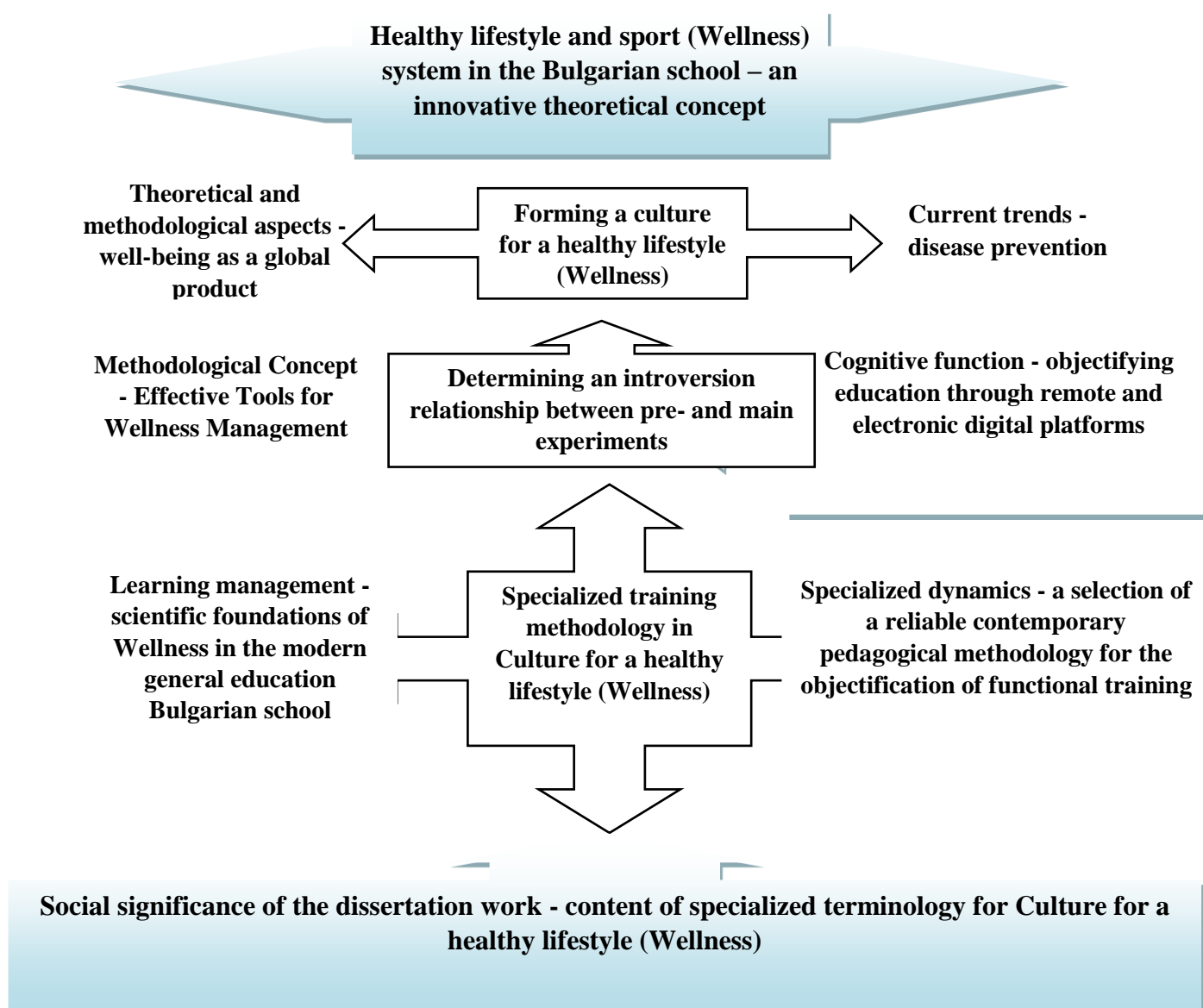
The school improvement plan provided in the pedagogical models in this dissertation is a framework for analyzing problems, identifying root causes, and addressing school learning where insufficient progress has been made in student academic achievement. Planning school improvement based on a healthy lifestyle (Wellness) in school is a new concept for the Bulgarian education system.

In the present work, we clarified the complex possibilities of the system for evaluating the effectiveness of specialized normative tools for managing the pedagogical process for establishing a culture of a healthy lifestyle (Wellness) in the Bulgarian school.

Based on data from the regression analysis, the presence of a healthy lifestyle (Wellness) was established, based on the dynamics of tracked indicators and the statistical processing of the motor indicators determined in the research process, hypothetically determining the final result of the studied target groups. The most valuable information from the conducted diagnostics for the prevention of spinal distortions is the possibility of forecasting specific trends and features.

Undoubtedly, a trend of positive impact from the testing of innovative technology for the purpose of prevention was established. In this way, the cognitive effect of culture in a healthy lifestyle (Wellness) was proven. The conducted pedagogical experiment allowed to objectively establish specific trends and features, as a pedagogical technology for the prevention of spinal distortions was prepared and applied, successfully tested in the preschool stage.

Overview of the system for Healthy lifestyle and sport (Wellness) in the Bulgarian school.



**Figure 92.**

***Subsystems analyzed in the present dissertation***

## **Chapter Four**

### **IV.1. Conclusion**

The analysis of scientific achievements from specialized literature and summarization of practical experience showed that the effective motor activity is directly affected by the combined impact on the control system.

A first attempt was made to objectify, the application of a healthy lifestyle (Wellness) by introducing innovative methodologies and technological models for wellness competence in establishing a culture for effective management of the pedagogical process in the Bulgarian school in response to the regulations in the Law on Primary and Secondary Education.

In the present work, regularities for achieving an effective manifestation of specialized technology in a culture for a healthy lifestyle (Wellness) are summarized. Innovative methods have been applied to influence the effectiveness of a healthy lifestyle (Wellness) in school.

Specific parameters and specifics characterizing the healthy way of life (Wellness) in the Bulgarian school have been analyzed and systematized. The directions in its development in the new century are marked.

Based on the research and studies so far, innovative and proven effective tools for the development and management of the educational subsystem of the healthy lifestyle (Wellness) in the Bulgarian school have been sought and statistically proven, practically implemented. The obtained results are important for placing management in the education of pedagogical personnel and the educational-preparatory process on a scientific basis.

The possibilities for objectifying education through remote, electronic, digital platforms /mozaBook/, both in the process of learning at the preschool stage and for students in the initial stage of the basic educational level, are reported.

The differentiating sensitivity of conventional control systems has been demonstrated. The differentiating ability in the preschool and primary stage of the educational level at established levels of acquired motor skills, as a result of applied innovative methods and technologies, was analyzed.

The multi-directional study of the systems for benchmarking-analysis of educational control tests and applications for wellness competence, allows to account for the manifestation of the possible elements of subjectivity, putting on a scientific basis the restrictive conditions of obtained evaluations in the management of specialized contingents. A selection of reliable modern pedagogical methods was made to objectify the functional training.

The differentiating ability of a selected set of tools, applied in the management of motor and functional capacity, has been proven by measuring tracked indicators: anthropometric, physio-metric, neuropsychological, tenso-metric and motor indicators.

Scientific evidence defining specific applications for wellness competence and tools for practical application of a healthy lifestyle and sport (Wellness) in the Bulgarian school are substantiated. Content is clearly defined in setting verbal levels of assessment and effectiveness in school wellness implementation.

Experimental data indicate regularities in the practical application of motor activity. The harmonization between the possibilities of the proposed experimental methods and technology for the prevention of spinal distortions reinforces the significance of the scientific results of conducted pedagogical experiments.

On a national scale, the first systematization and modeling for the study of wellness competence (Wellness) in Bulgarian education has been done. Theoretical principles in the evaluation system have been adapted for the needs of the pedagogical process in Culture for a healthy lifestyle (Wellness). A

complex evaluation of the effectiveness of the application of a specialized methodology has been created.

The carried out benchmarking-analysis of educational tests and applications for wellness competence undoubtedly proved the establishment of a healthy lifestyle (Wellness) in the Bulgarian school. The developed educational project programs on Culture for a healthy lifestyle (Wellness) from preschool to fourth grade through the implementation of pedagogical levels in wellness training are available in appendix 4, page 78. Innovative teaching methods have been specified, and educational methodologies.

#### **IV.2. Scientific conclusions**

The performed analysis of the results allows formulating the following scientific conclusions:

1. The experience of training in a healthy lifestyle culture (Wellness) at school is systematized and summarized;
2. The specifics were studied and the training was objectified to achieve a culture for a healthy lifestyle (Wellness) in school;
3. Laws and trends are defined to increase the efficiency in the pedagogical process for forming a culture for a healthy lifestyle (Wellness) in school.
4. Specific conclusions by types of experiments in practice:

*First experiment:* The conducted regression analysis determined a Fechner correlation coefficient,  $R_f=0.60$ , for a significant linear correlation, from applied technology. The verification of null hypothesis  $/H_0/$  proved the alternative hypothesis  $/H_1/$  of the research on the pedagogical progress of the students. The presence of a Healthy Lifestyle (Wellness) in school has been established. The values of the t-criterion ( $t=6.99$  and  $p<.00001$ ) prove the reliability of  $H_1$  with the

Matiash test - for the sample. The value ( $t=8.12$  and  $p<.00001$ ) proves the reliability of  $H_1$  for the Depth slope test.

*Second experiment:* Motor development - 7/10 years of age proceeds evenly with a gradual increase in average values of anthropometric indicators. No significant parametric differences were observed between the two genders. Variation coefficient  $V=5-9\%$  is more pronounced in girls, due to acceleration processes. In the dynamics of the measured living capacity – boys increase with average values for 1st grade -  $1814\text{ cm}^3$ , 2nd grade -  $1967\text{ cm}^3$ , 3rd grade -  $2206\text{ cm}^3$ , 4th grade -  $2350\text{ cm}^3$ . The total increase is  $542\text{ cm}^3$ , (28.6%). In girls, the total increase is  $689\text{ cm}^3$ , (48.1%). Variation coefficient is  $V=15-20\%$ . The higher values of the vital capacity of boys decreases with increasing age, the difference between the two groups decreases, but the percentage increase in girls is 45.4% higher than boys - 29.5%. The girls are lagging behind on the speed-power indicator. The established physio-metric indicators show that the intensity is good and is equally distributed over the two studied groups. The differences between the two genders are clearly outlined at the end of the study, with speed showing a weak tendency towards dispersion with increasing age - 18.3-22.7%, and the total increase is 8.1%.

Neuro-psychic reactivity - an improvement is registered with increasing age. Boys have higher absolute values than girls in tests of speed and maximum frequency of movements /Tapping test/. Total increase: girls - 21.9%, boys - 12.8%.

Emotional resilience - total growth similar for both genders: boys - 33.7%, girls - 34.9%, (indicator of appropriate workload).

In motor development and motor activity, we found a weak to high correlation dependence. For girls, the correlation varies from  $r=0.85$  to  $r=0.57$ . A significant to high dependence was found  $r=0.87$  – 9 years of age. In boys, the association of body mass with arm strength was moderate to significant  $r=0.31-0.59$ . The

relationship between body mass and torso strength for boys is weak with an upward trend to moderate  $r=0.22-0.47$ . An increase in body mass contributes to an increase in muscle mass in boys. In girls, a decrease was found from moderate  $r=0.36$  to weak  $r=0.19$ . There is a weak to moderate and significant correlation between the tests applied in practice.

The structural-building components of the motor capacity clearly outline the existence of a healthy lifestyle through sport (Wellness) in the Bulgarian school. A moderate dependence of the results on 40m was found running  $r=0.45$  - 7 years of age and shows an upward trend and reaches a significant  $r=0.58$  - 9 years of age boys. The dependence of the rebound height indicator from place - from moderate to significant - boys  $r=0.42-0.54$  and moderate - girls  $r=0.31-0.39$ . Girls - correlation coefficient is higher - 7 years of age.  $r=0.34$  and reaches  $r=0.6$  - 9 years of age, girls demonstrate better speed when reinforcing with a rebound. The highest is the relationship between jump with reinforcement and long jump from place  $r=0.68-0.62$  in boys and  $r=0.4-0.61$ . Girls - a direct relationship between explosive power of the lower limbs and realization in achievements.

Homogeneity was found in EG when testing for motor quality agility. Correlation coefficient  $R_f=0.86$  - a significant dependence in the development of motor quality agility in EG. After testing the Blaze-Pod Trainer application, a direct correlation was established between the results for the development of agility and improving the level of motor capacity in EG. An increase in mobility in the joints, flexibility of the muscles, dexterity and speed of reaction is observed. The alternative hypothesis  $H_1$  was confirmed. The coefficient of variation for test results for motor capacity level in the EG control stage recorded  $V=0.76\%$ , indicating a normal distribution. A *Student's t-distribution* was applied. The sampling distribution for EG is normal:  $H_1:\mu\neq 18.23$ . Starting from  $tT=1.72 < t_{em}=11.11$  proves a valid  $H_1$ . The established changes in the results are a consequence of the training with the Blaze-Pod Trainer application.



*Third experiment: (benchmarking analysis between Eurofit and DOS)*

Deficiencies in DOS were found: The test battery has limitations due to a small number of tests; they require special equipment and a long time to perform; Lack of control over some motor qualities through high standards; it does not allow direct comparison of results by gender and age.

Recognized advantages of Eurofit: The tests are standardized, do not require prior learning, do not take much time to perform, do not make it difficult for the performer; They apply equally to both sexes, no special equipment is needed; The tables are convenient and allow comparing the results between all ages and genders in schools, settlements, countries; Eurofit is a comparable instrument with the DOS criteria in other subjects; Eurofit motor activity scores do not correlate with overall success; Overall rating for motor activity - very good, but the Eurofit rating is one category higher than DOS.

5. The established permanent and constructive trend in the promotion of a healthy lifestyle and sports (Wellness) in preschool and school environments has been proven for the first time in Bulgaria, through detailed long-term measurement of motor indicators, allowing analysis for the diagnosis of specific features in the development of motor potential in those practicing regular motor activities.
6. Research provides information on how preschool and school environments influence the quality of life and, in particular, the motor activity of students, in response to key competence #9 of the Law on Preschool and School Education.

#### **IV. 3. Recommendations for practice**

Based on the data from the conducted medical-pedagogical studies and statistically substantiated conclusions, the following recommendations for practice can be made:

1. Introducing a combined health-pedagogical impact to achieve a Healthy Lifestyle and Sports (Wellness) in school, as a new approach to managing the PES curriculum, wellness competence in the Bulgarian school is investigated.
2. Based on the development and implementation in practice of innovative educational and functional-motor levels, allowing prediction of motor potential of students in preschool and elementary stage of the basic educational level in the PES profile.
3. Based on the research on age dynamics and determining the relationship between some main indicators of motor and functional development, motor activity and neuro-psychic reactivity of students and children - 6/10 years of age, motor development by gender was tracked, abstracting from ontogenetic development.
4. Application of a European system and implementation of a benchmarking-analysis with the current educational system for DOS in our country - comparison of effectiveness, in the study of wellness competence in the Bulgarian school, with the identification of gaps in the curricula, establishment of impacts and functional fitness, combined with the application of Healthy lifestyle and sport.
5. The methodological basis of our research is of a scientific applied nature. Goal - improvement of teaching practice. The research is innovative in its part in approving purposeful practical experiments based on establishing a Culture for a healthy lifestyle (Wellness) through applied innovative methodology of yoga practices,

innovative spine-corrective technology and methodology related to the Blaze-Pod Trainer system and constative in its statistical-mathematical part.

The applied author's methodology, based on complexes of corrective gymnastics and adapted yoga practices in the conditions of a modern "Montessori-kindergarten"<sup>11</sup>, aimed at the prevention of postural disorders and correction of spinal distortions, intended for children of preschool age, is currently practiced in the practiced in a kindergarten "Slaveiche", town of Vratsa.

The application of the author's innovative methods and technologies, systematic studies and analyzes are based on accumulated practical and theoretical experience as a teacher of the PES methodology. The combined impact improves management in the system for the endorsement of Healthy Lifestyle and Sport (Wellness).

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<sup>11</sup> The Montessori method - a pedagogical system, is based on the ideas of free education and is in accordance with humanistic pedagogy, where an important place is given to sensory education /development of the senses/ through didactic classes in a specially organized environment.

#### **IV.4. Theoretical contributions**

This dissertation makes the following theoretical contributions:

- ✓ Within the framework of author's methods implemented in practice and a specialized application, a theoretical concept of the types of management subsystems in the education process to achieve a healthy lifestyle (Wellness) in the Bulgarian school has been upgraded with new knowledge.
- ✓ A Bulgarian model has been developed and implemented for pre-school and primary stage of basic education, built on acquired cognitive experience.
- ✓ For the first time, educational levels have been defined in management in the system of Culture for a Healthy Lifestyle (Wellness), based on theoretical principles through educational methods and technological models, adapted for specific needs in the development of a healthy lifestyle (Wellness) in the Bulgarian school.
- ✓ The system of Culture for a Healthy Lifestyle (Wellness) was analyzed as a social structure and the management levels were defined, according to our experience as a researcher and practitioner (period - 2011-23).

#### **IV.5. Practical-applied contributions**

The present dissertation contributes the following practical-applied contributions:

- ❖ For the first time in Bulgaria, tools for objective assessment of motor capacity have been developed for training in Healthy Lifestyle and Sports (Wellness).
- ❖ Based on a combined evaluation of a specialized methodology for a healthy lifestyle and sports (Wellness), a point system was developed. The introduction of educational levels in the pedagogical practice allows forecasting and response to key competence No 9 for a healthy lifestyle and sports (Wellness) in the Bulgarian school.
- ❖ The new author's methodology created for the needs of the PES subject at school improves the possibility of achieving a Healthy Lifestyle (Wellness), in accordance with the requirements of the Law.
- ❖ The author's programs are implemented in extracurricular forms of education. Verbal evaluations for the effectiveness of the Wellness methodology in performing specialized motor actions are objective help for the teacher.
- ❖ The research and teaching experience in the field of teacher training helped us to identify opportunities for improving the methodology for Healthy Lifestyle (Wellness) in the Bulgarian school.
- ❖ The conducted studies prove the effectiveness of innovative technology for the development of agility and improvement of motor capacity through a proprietary complex connected to the Blaze-Pod Trainer application.
- ❖ The development of motor potential is a basic direction on which one can work to improve the effectiveness of PES training and enrich knowledge, stimulate the need for movement, in response to the requirements for the development of key competence No 9.

## Scientific publications related to the dissertation work

<i>Indicator</i>	<i>Educational Scientific Degree Doctor; Articles, Book</i>	<i>Language</i>
<i>A.1.</i>	Pedagogicheska tehnologiya za preventsiya na grabnachnite izkrivyavaniya pri 5-6 godishni detsa v usloviyata na detska gradina	BG
<i>F.8.</i>	Importance of motor skills in order to increase the overall physical capacity of children, Smart Inovattions in Recreative & Wellness Industry and Niche Tourism - Scientific Journal Vol. 2 Issue 1-2, ISSN: 2603-493X , eISSN: 2603-4921(online), page 40-44, Sofia 2020.	ENG
<i>F.8.</i>	Prosledyavane dinamikata v dvigatelniya potentsial i ustanovyavane na uelnes kultura - progimnazialen etap - Smart inovatsii, Rekreativna & Wellness Industriya i Nishov Turizam, T.4, (1-2), c. 19-25, 2022 / 1-2.	BG
<i>F.8.</i>	Educational tools for building a school wellness culture Образователни инструменти за изграждане на уелнес култура в училищна среда (School Wellness Culture), Obrazovatelni idei i metodicheski paradigmi, Sbornik v chest na 60-godishninata na prof. dn Dimitar Veselinov, UI "Sv. Kliment Ohridski", ISBN: 978-954-07-5567-0, str. 342-347, 2022.	BG
<i>F.9.</i>	Smart kognitiven instrumentarium vanshna otsenka na profesionalni kompetentsii za kadri v nishov turizam, Izdatelstvo: NSA Pres, ISBN: 978-954-718-675-0, Sofiya, str.84-110, 2021.	BG

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