**STATE UNIVERSITY OF PHYSICAL EDUCATION AND SPORT OF THE REPUBLIC OF MOLDOVA**

**The manuscript title**

**C.Z.U: 796.012.2:373.037.17373.3(043)**

**BURLUI Raluca Madalina**

# THE DEVELOPMENT OF COORDINATIVE SKILLS AND THEIR INFLUENCE ON THE SCHOOL PERFORMANCE OF PRIMARY SCHOOL PUPILS

**Specialty: 533.04. Physical education, sport, kinetotherapy and recreation**

Summary of Doctoral Thesis in Education Sciences

**Chisinau, 2023**

**The thesis was developed within the Doctoral School of the State University of Physical Education and Sports**

**Composition of the Commission for public defense:**

1. **BUFTEA Victor**, dr. habil. in pedagogical sciences, university professor, State University of Physical Education and Sport – president
2. **MOISESCU Petronel Cristian**, PhD in human motor sciences, university professor, Dunarea de Jos University of Galati, Romania – scientific coordinator
3. **CARP Ion**, PhD in pedagogical sciences, university professor, State University of Physical Education and Sport – official rewiewer
4. **CIORBĂ Constantin**, dr. habil. in pedagogical sciences, university professor, SPU ”Ion Creangă”, Chisinau – official rewiewer
5. **DOBRESCU Tatiana**, dr. habil. in physical education and sport, university professor, ”Vasile Alecsandri” University, Bacau, Romania – official rewiewer.

The thesis will be defended on 29 June 2023, at 11.00, room 105 (small hall of the Senate), in the meeting of the Commission for public defense of the doctoral thesis within the State University of Physical Education and Sports of the Republic of Moldova (22 Doga A., str. Chisinau, MD-2024).

The doctoral thesis and the summary can be consulted at the Library of the State University of Physical Education and Sports and on the ANACEC website.

**President of the Public Defense Commission**,
dr. habil. in pedagogical sciences,
university professor Buftea Victor

**Scientific coordinator,**
PhD in pedagogical sciences,
associate professor Moisescu Petronel Cristian

Author: Burlui Raluca Mădălina

**CONTENT**

# INTRODUCTION

**Actuality and importance of the problem addressed.** Physical education represents one of the multiple forms of education, which through its contribution has led to a continuous improvement of the life quality in the sense of physical development, (movement skills necessary for future adults, for easier integration into society, but also rapid adaptation to its requirements) and intellectual one. [3]

In the view of Firimita M., [15, p.19], physical education represents a doctor at everyone's fingertips, with an important role in the growth and harmonious development of the body, but also in its regeneration in case of illness.

The famous pedagogue Nicola I., [25, p.199], appreciates that pedagogical meaning of the notion of physical education implies the reflection of its effect on all other sides of education: intellectual, moral, aesthetic and polytechnic, and through its specificity physical education contributes to functional development, thus favouring the development of intellectual activities in optimal conditions.

The close connection between the physical and the psychic sphere is emphasized by numerous pedagogues and philosophers. A convincing theory in this sense is that of the thinker Chernisevski, quoted by Siclovan, in whose opinion "any work is physical intellectual work." The author appreciates that these two sides interrelate and influence each other, thus we can conclude that: "brain activity always involves some contribution of muscles, and muscle activity is always carried out under the guidance of brain activity." [26, p.95]

Referring to possible means of action to remedy critical learning situations, Rogers, C., (1969) and Rogers, F., (1994), propose some strategies for teachers in the relationship with pupils: a positive response for all pupils' experiences; the use of pupils' ideas in the training process; appreciation and encouragement of pupils stimulates self-esteem and school success; less formal teacher-pupil discussions; adapting the contents of the training to the pupils needs; encouraging them based on the "tonic smile". [21, p.129]

It is also important for people to understand that intelligence is not determined solely by genetics. As Aristotle stated, thinking and developing some answers in certain situations only belong to the experience of each individual, and Plato was of the opinion that brain activity has an internal origin, influenced by the external environment. In other words, intelligence is an interrelation of the biological environment with the social-psychological one and has a bio-psycho-sociocultural structure. Thus Belleau, J., (2015), a follower of this idea, is of the opinion that taking into account the brain's neuroplasticity, an aspect that can act to enhance learning, creates a balance between body, spirit and psyche [29]. Neuroplasticity refers to the communication between the cerebral hemispheres, which also affects the emotional state. The cerebellum and brainstem are involved in managing emotions and memory. The cerebellum is also responsible for maintaining balance and body posture. But it also plays an important role in motor coordination, the same author tells us.

From the analysis of the previously presented, we can deduce that the problem under research is one of great theoretical importance, but also of a practical nature, and the development

of coordinative skills in the physical education class is the optimal solution to make the transfer of acquisitions from this discipline to the acquisition of new knowledge in other disciplines.

The development of the motor capacity of the individual is based on the learning of new motor skills, by modifying and assembling existing motor programs, Smith Churchland, P., (2020, p. 571). This can be the definition of coordinative skills, given the characteristics of them.

The specialized literature presents the definition of coordination given by most authors as a complex motor ability capable of regulating and directing independent actions or those that involve the whole body; the ability to master the motor movement, to make the transition easily from one action to another, depending on the changing demands of the environment.

Bastiurea, E., highlights a number of five coordination skills, a classification with which we also agree, respectively: [2]

"- the ability to appreciate and adjust the dynamic parameters and the spatial-temporal parameters of the motor act;

- the ability to maintain balance;

- the sense of rhythmicity;

- the ability to orientate in space;

- the ability to coordinate movements, they can be processed and perfected according to the function of the athletes training objectives."

Erwin Hahn (1996), a specialist in practical activity, makes the following statement "a large number of motor qualities are regrouped in the concept of coordination". The author insists on how coordination is carried out "the simultaneous action of the central nervous system and the skeletal muscles to execute a voluntary movement, in such a way that there is a harmonious chaining between different components of this movement". [25]

Regarding the coordinative skills, we can say for sure that they have a strong imprint from genetics, this aspect having influences in conditioning the degree of trainability. In this sense, specialists in the field have established special methodical measures and indications for developing them: [13]

- "acquiring more motor skills;

- the progressive increase in the difficulty of the exercises from the first stages of learning, focusing on the precision of the executions or on the integral coordination of the movement;

- avoiding exercises that cause athletes to cramp;

- schedule the training sessions with tasks from the coordinative skills to be done at the beginning of the lesson, after the warm-up;

- ensuring optimal rest intervals to favour the complete restoration of the effort capacity;

- scheduling an increased number of lessons with tasks from coordinative skills, but the volume per lesson will be reduced".

Harre (1979), recommends us to improve coordination, general methods (varied use of the number of information provided by analyzers or increasing the degree of complexity of the execution possibilities) and methods specific to the forms of capacity manifestation (executions of segmental coordination between the upper and lower members, the use of information technologies

for self-observation or the shots determination from variable positions and distances, the stimulation of balance in static and dynamic actions, executions that require the reaction to visual, auditory, tactile or kinesthetic stimuli, the generation of unforeseen situations or the use of rhythm variations). [26]

If in the instructive-educational approach we will be able to educate pupils in the sense of acquiring skills to maintain a close relationship between the quality of perception (as realistic as possible), attention and language on the one hand, and mental representations, linguistic memory, and the basic morphosyntactic structures on the other hand, then the emergence of new ideas, we can say that it is a result of thinking, which will represent the correct way of interpreting and understanding the environment in which they live. [21]

**Description of the situation in the field of research and identification of problems.**

The present research approach began with a careful observation of the system's educational shortcomings, as a whole, but also of those existing in approaching the physical education lesson.

The age stage (9-10 years) falls under the prepubertal age (7-10 years). This period is particularly important for the growth and development of the pupils' body, because the plasticity of the nervous system thus facilitates the accumulation of motor information, which results in the improvement of coordinative skills. In this sense, we believe that for primary school pupils, a program that contains effective means of developing coordinative skills can effectively contribute to the harmonious development and strengthening of pupils' health, with real beneficial influences on the intellectual sphere, all this leading to the achievement of a higher school performance.

**Important scientific problem solved.** The analysis of the situation regarding the content of physical education at the level of primary education in Romania, highlighted a series of problems related to the low level of training and physical development of pupils of the given age. Speaking about physical training, i.e. the level of development of motor qualities, it has been demonstrated that, compared to other basic qualities, coordination capacities are developed at a rather low level, and their directed development could positively influence both the level of training and physical development, as well as school performance in general.

**The purpose of the research** consists in improving the instructional - educational process in the "physical education" discipline of primary school pupils, by developing coordination skills and increasing school performance.

**Research objectives:**

1. Analysis of data from specialized literature regarding the issue of motor skills and intellectual performance in pupils aged 9 - 10 years.

2. Observing the evolution of motor capacities and determining the favourable periods for the development of coordination skills, taken separately.

3. Elaboration of models in order to apply specific means for the development of coordinative skills and highlighting their influence on the school performance of pupils.

4. The theoretical and experimental argumentation of the designing the system of specific means for the development of coordinative skills, in the educational approach, within the physical education lessons.

**Research hypotheses**

In the research approach, we started from the following premises:

*Hypothesis 1*. By elaborating and applying an experimental program in order to develop coordinative skills in the physical education lesson, we will also achieve better results in terms of the school performance of the pupils.

*Hypothesis 2.* We believe that if at the age stage, 9-10 years, we act using a series of means specific to physical education, carefully selected and dosed according to the particularities of age and training of the subjects, then the indices of coordinative skills will reach higher values.

*Hypothesis 3.* Implementation of means for the development of coordinative skills, with real influences on school performance, can be an effective action strategy in physical education lessons, but also an attractive factor, by diversifying the means applied.

*Hypothesis 4*. The application of specially selected means during the experimental research will create positive correlations with higher indicators of school performance;

*Hypothesis 5.* The proposed action program specific to the physical education lesson, leads to the development of coordinative skills, in varied conditions, on the one hand and, on the other hand makes the transfer of acquisitions from the gym to the classroom, in the sense of making it easier correlations between theoretical knowledge;

**Synthesis of research methodology**: In this study, general research methods were used, specific to the field of physical education and sports, but also psychology, which have as their main objective the revealing of the importance of coordinative skills in the school performance of primary school pupils.

The realization of the formulated tasks was possible using the following research methods:

- ✔ **Theoretical: - Analysis of specialized literature** - is a method that requires a rigorous and systematic documentation of the scientific topic to be researched.
- ✔ **Empirically:** observation, questioning, testing, formative evaluation through the proposed activities.
- ✔ **Statistics:** the psychopedagogical experiment - includes the stage of ascertaining the training and control, statistical processing and interpretation of experimental data.

**The experimental basis of the research** is made up of pupils of the "Mihail Sadoveanu" Secondary School in Galati, from the third grades, as follows:

- Experimental group - 3rd grade B, with a total of 31 pupils (16 girls and 15 boys);
- Control group – 3 rd grade A, with a total of 27 pupils (15 girls and 12 boys);

**Scientific novelty and originality** consists in the development and implementation of an experimental program focused on the development of coordinative skills in physical education lessons and their influence on the school performance of primary school pupils.

**The important scientific problem solved in the researched field** consists in insufficient research on the role and influence of motor training and the development of coordinative skills in physical education lessons on the school performance of primary school pupils.

**Theoretical significance** of the present research consists in the development of a modern and current action program at the primary level of education, in accordance with the school curriculum and the intellectual level of pupils.

**The practical value** of works, consists in the possibility of specialized teaching staff regarding the application of the means for the targeted development of the coordinative skills of primary school pupils during physical education lessons.

**The main scientific results submitted for defence:**

1. Analysis of the level of manifestation of coordinative skills in primary school pupils;
2. Research and analysis of the index values of coordinative skills and school performance obtained by participating subjects in the present study;
3. The development and substantiation of the experimental program that is the basis of an increased school performance, by developing the coordination skills of 9-10-year-old pupils;
4. The methodology regarding the implementation of the elaborated experimental program.

**Approval of scientific results**

The results of the conducted research were analyzed and published in the following scientific events and in specialized journals in the country and in the Republic of Moldova, as follows:

- International Scientific Conference 8th edition "Achievements and Prospect in the field of Sport Science and Physical Education within the Interdisciplinary European Education System", Bacau, November 9-10, 2018;
- International Scientific Conference "Sports, Education, Culture - Interdisciplinary Approaches in Scientific Research", Galati, June 7-8, 2019;
- International Scientific Conference 7th edition "Achievements and Prospect in the field of Sport Science and Physical Education within the Interdisciplinary European Education System", Bacau, November 15-16, 2019;
- The continuous training of the physical culture specialist in the modern acmeological concept - Materials of the international conference Chisinau, 2020;
- International Scientific Conference "Youth in the Perspective of the Olympic Movement", Brasov, March 19-20, 2021;
- International Scientific Conference "Sports, Education, Culture - Interdisciplinary Approaches in Scientific Research", Galati, May 28-29, 2021;
- The Science of physical culture. Theoretical-scientific journal, No. 38/2, 2021;

**Thesis structure.** The work contains a total of 263 pages, of which .....pages are the basic part, structured as follows: annotation (Romanian, Russian, English), list of tables, list of figures, list of abbreviations used in the thesis, introduction, three chapters, general conclusions and recommendations, references - 223 titles, 10 appendices,16 tables, 94 figures.

**Summary of the thesis sections**

In the ***Introduction*** the importance and actuality of the researched topic was argued, also there were revealed the purpose, objectives and hypothesis from which we started. Also here are presented the scientific novelty of the research, the theoretical and practical value of this approach, the applied value of the work and approval of research results.

***Chapter one*** of the thesis, "Conceptual guidelines regarding the organization of the primary school pupils' physical education ", the objectives and forms of organizing the discipline of physical education in modern conditions, ways of increasing coordinative skills and fundamental notions of the concept of intelligence IQ but also of school performance are presented. The age characteristics of the students included in the stage 6/7-10/11 years were also handled. Furthermore, there were addressed aspects regarding the ways to evaluate pupils' knowledge in the primary cycle.

In ***the second chapter*** of the thesis "Assessing the level of motor and academic performance of the primary school pupils", the level of development of motor capacity in primary school pupils was determined and the measurement of the optimal age stage, at which they manifest themselves more obviously, the evolution of school performance during a school year . This chapter also includes detailing the methodology used in organizing and conducting the experiment. The data obtained as a result of the ascertaining experiment showed us that the age stage in which the coordinative skills manifest themselves more obviously is the stage of 9-10 years. At the same time, this chapter also includes the analysis and interpretation of the answers obtained from teachers specializing in physical education, but also with other specializations in the educational field, for the applied questionnaire (Appendix...).

In carrying out this research, it was kept in mind the methodological provisions which applied rigorously, giving veracity and scientific importance to the work.

***The third chapter*** of the thesis "Experimental argumentation of the influence of the coordinative skills development on the academic performance of primary school pupils" captures the dynamics of motor indicators, school performance and emotional intelligence of primary school pupils aged 9-10 years included in the pedagogical experiment.

Following the dynamics of the indices of the coordinative skills components, emotional intelligence and school performance, we can state that they are closely related.

In the *general conclusions and recommendations*, the positive influence of streamlining the instructional-educational process in the physical education class was detailed, by applying modern means of developing coordinative skills and emotional intelligence, with strong positive influences on school performance.

The general conclusions formulated confirmed the hypothesis and the purpose of the research.

This part of the paper also contains recommendations that we make based on the results achieved from this research.

# 1. CONCEPTUAL GUIDELINES REGARDING THE ORGANIZATION OF THE PRIMARY SCHOOL PUPILS' PHYSICAL EDUCATION

## General trends regarding the organization of primary school pupils' physical education

The first references to physical education date back to antiquity, when it became a component of the educational ideal, this being mentioned in Roman terms - "Mens sana in corpore sano" [18, p.108]. This phrase was developed by Juvernal, after watching gladiator fights [32] or in the Greek gymnasiums - "KALOSKAGATHON - handsome and good man". Other references belong to the philosophers Xenophon, Plato and Aristotle, who stated that since those times physical education was considered an important aspect in the formation of man, even a condition of his development, physical exercises being practiced in school [8, p.9]. Other reputed world sages emphasize the importance of exercise for medical purposes. Starting from this idea, the doctor of Chinese origin Kong-Fu, believes that the secret of curing any condition lies in the practice of respiratory gymnastics in parallel with the execution of physical exercises complex that he personally developed.

In ancient Greece, Hippocrates (460-375), Aesculapius, Pythagoras and the renowned surgeon Antiles, are of the opinion that physical exercises ensure a harmonious physical development, by improving metabolism, breathing, blood circulation, but also stimulating the activity of glands with internal secretion [20, p.104].

Nowadays, renowned specialists in the field maintain the idea that physical education is a form of education, a component of general education, which is organized and carried out according to well-established rules, with various forms of organization and development. This aims to improve the quality of life, by optimizing the biological, psychomotor and cognitive potential of the individual and having as the final goal, the continuous improvement of the life quality [3, 5, 7, 12, 15, 17, 24, 30].

Numerous pedagogues and philosophers have noticed the existence of a close connection between the physical and psychic spheres. Thus, the thinker Cernisevski, cited by Siclovan I. [26, p.195], elaborated a convincing theory, specifying that: "any work is physical intellectual work", because these two sides interrelate and influence each other. From this statement it follows that: "brain activity always involves some contribution of muscles, and muscle activity is always carried out under the guidance of brain activity."

To achieve the objectives of physical education at the primary level by using traditional means and methods, it is often a difficult task to accomplish, because the pupils included in this level of education are not always determined to work in the physical education class in accordance with the requirements of the teaching staff. They are constrained by the prejudices of their parents that it is not good to exert yourself because you will "get sick" or "get seriously injured", to which is added the long period of time spent in front of the devices, which forms the habit of changing always playing when they are bored, an aspect that is not possible most of the time within the instructional-educational process. We believe that a solution within everyone's reach is the game, rigorously chosen and creatively adapted according to the level of development of the pupils and the objectives to be met within each lesson. In the physical education class, the game can be used to

achieve the objectives set out in the school curriculum without the pupils thinking that it is difficult to make an effort. A personal point of view is that, the game hypnotizes the pupils and attracts them with its magic. Also through the game we can polish the behaviours when necessary. The young schoolboy is attracted by the game, but also to the rules, an aspect that must be exploited to the maximum. For the sake of the game, pupils are willing to change their inappropriate attitudes and behaviours (nervousness, aggression, lack of fair play, etc.), quickly becoming real examples to follow.

Motion games, according to specialists Colibaba-Evulet, D., and Bota, I., Dragu, M., Ghimp, A., and Budevici-Puiu A., are synonymous with didactic games, applied in the field of physical education, for improving motor activity in difficult conditions [10,14,16]. These games have a proven educational efficiency, with a predominantly motor structure, and are most often conducted in the form of competition. That is why the participants concentrate all their forces in order to achieve victories, all of which bring good mood.

Coordinative skills have obvious influences in learning and improving basic motor skills and specific to sports games, favouring the development of other motor qualities or by developing motor acts and actions in various situations. To begin with, visual information predominates in importance, with kinesthetic information becoming increasingly important.

Starting from the classifications of the forms of the coordinative skills manifestation, Serbanoiu, S. [28, pp. 93-97], makes a description of their forms of manifestation, which we present below:

• spatial orientation ability favours changes in body position and movements both spatially and temporally in relation to other participants in the activity or to other objects and has an important role in sports where a permanent adaptation of movements is required;

• the ability for kinesthetic differentiation is decisive in the formation of the technique by intervening at the level of the force of the blows or the impulses exerted on the ground;

• the ability to balance favours the athlete's possibility to maintain a balanced position both in static situations and in those that require movements or imbalances, being an important form of manifestation in sports where support variations or accelerations are encountered;

• the ability to react facilitates the occurrence of motor actions as a result of the impulses coming from different stimuli, sports training being attributed to its complex form, that of the responses that arise to unknown stimuli;

• the ability to rhythmize (sense of rhythm) represents the possibility of the body to repeat different motor actions in a precise spatio-temporal structure, being responsible for motor responses in both cyclic and acyclic executions;

• the ability to transform the movement facilitates the adaptation and modification of the motor program according to the occurrence of unforeseen situations during the actions;

• the ability to combine and connect movements favours the establishment of links between automated motor skills such as the sequence of elements in gymnastics, running, jumping or pedalling.

The German authors Hirtz, P., (1976), Hirtz, P., Ludwing, G., Willnitz, J., (1981), cited by Bastiurea, E., [2, p.90], believe that the optimal age for the development of coordinative skills is included in the 7-10 years stage. The author Bompa, [4, p.416], is of the opinion that the optimal age for the development of coordination skills is 9-10 years, when the plasticity of the nervous system (ability to change and adapt according to the environment) is much higher than at the age adult, for Manno, R., [110, p.139], this stage is between 6 – 13 years, and the author Cojocari, D. (2014, pp.14-29), appreciates that the maximum intensity of skill development of coordination, can take place in the age stages between 7-11 and 14-18 years.

The notion of intelligence has been and is one of the most intensely contested by many specialists who see it as defining the results of IQ intelligence tests. Other specialists see it as a set of skills such as: thinking in abstract terms, learning based on experience, effective adaptation to the environment, etc. [1].

The specialized literature talks about "general skills" as the key to success in various fields, but there are also opinions according to which there is only one general skill, namely intelligence, because it is present in any activity [27, p.78].

School success is the optimal alternative to school performance. This is given by the theoretical training, but also by the ability to put these notions into practice, with optimal efficiency. School success is expressed by marking with grades from 7 to 10 or with the qualifier "good" or "very good", as well as by obtaining prizes and diplomas in the activities carried out on a national level, but also internationally: technical-scientific , cultural, artistic, sports, etc. Another important aspect of school success is given by the special qualities of the pupils' personality, embodied by: intellectual abilities (creativity, imagination, abstract thinking, logic), ability to adapt to the school and social environment, outstanding skills, the desire to overcome oneself and to perform, etc.

In simple terms, we can define performance as a result that exceeds the average level of performance in a field. But in the definition accepted by the vast majority of specialists, performance is represented by the results obtained by pupils and depends on a number of factors, such as: the intensity of motivation, the type of task, the pupil's awareness of the task difficulty, self-esteem, own level of aspirations, how attractive the performance is, etc. [9].

## 2. ASSESSING THE LEVEL OF MOTOR AND ACADEMIC PERFORMANCE OF THE PRIMARY SCHOOL PUPILS

The premises of the preliminary research

In the conditions of the existence of a small amount of information regarding our topic, the approach to the instructive-educational process from the perspective of the role of coordinative skills in achieving school performance and the development of emotional intelligence, represents a premise that ensures a deep knowledge of the educational field.

As part of the research premises, we had as main objectives the identification of the level of coordinative skills of primary school pupils through specific tests, the determination of the evolution of school performance during a school year and the increase of the level of emotional intelligence.

If there are obvious correlations between the optimal development of coordinative skills and cognition, this could be the strength of the field of physical education and this discipline could gain the same importance in society's perception as other disciplines. Given these arguments, an increased number of hours per week of physical education would be fully justified.

This preliminary research aimed to identify the initial level of coordinative skills, and the evolution of the school performance of 111 pupils (one grade at each level, respectively 1st grade 25 pupils (9 girls and 16 boys), 2nd grade 30 pupils (12 girls and 18 boys), 3 rd grade 25 pupils (10 girls and 15 boys) and 4th grade 31 pupils (19 girls and 12 boys), by applying a set of nine tests for the assessment of coordinative skills, and to determine the evolution of school performance, school documents (classbook) will be studied.

The main concern is to verify the work tools and to present results regarding the initial level of motor skills of the pupils in order to be able to develop an exercise program aimed at developing coordination skills on the one hand as well as recording the effects on school performance, on the other hand.

**Organization and conduct of the ascertaining experiment**

The research activity was carried out within "Mihail Sadoveanu" Secondary School in Galati, during the period 2017-2021. The working sample beneficiary of the research was formed by the school pupils, a number of 111 pupils, respectively a 1st grade, a 2 nd grade, a 3rd grade and a 4th grade. Of those 111 pupils, 50 are girls and 61 are boys. The pupils are distributed by grade as follows: 1st grade 9 girls and 16 boys;2 nd grade 12 girls and 18 boys; 3 rd grade 10 girls and 15 boys; 4 th grade 19 girls and 12 boys.

The research was carried out in four stages, as follows:

***Stage I (October 2017 – March 2018)*** included: making the working plan, the study of the specialized literature regarding the methods and forms of organization of school physical education, the analysis of the instructional-educational programs in physical education for the primary cycle, the performance and school evaluation, but also the forms of manifestation among the primary grade pupils.

***Stage II (April 2018 – May 2019)*** consisted in developing the questionnaire and conducting the sociological survey, organizing the ascertaining experiment.

***Stage III (September 2020 - June 2021)*** - involved conducting the pedagogical experiment regarding the evolution of the motor and intellectual components, for the experimental group, by means selected according to the proposed objectives. During the whole duration of the pedagogical experiment, the activity of the experimental group was carried out according to the proposed methodology. In the control group, the educational process in the discipline of physical education was carried out using classical methods, the didactic activities taking place according to the usual methodical strategies, specific to classroom lessons, with the general objectives of the current curriculum.

***Stage IV (June 2021 - August 2021)*** - the statistical-mathematical interpretation and comparison of the data obtained from the tests performed and the graphic representation of the

evolution of each group. Based on the obtained data, the conclusions of the experiment were formulated.

**Ascertaining study regarding the perception of physical education in the Romanian education system**

The sociological research activity was carried out by applying a questionnaire containing 18 questions with 66 answer options, of which 14 questions are common, two specific to the discipline of physical education and two other questions specially developed for other specializations, on a sample of 300 teaching staff (150 teaching staff with physical education specialization and 150 teaching staff with other specializations), with higher education and with work experience between 1 and 30 years. They teach both in the rural and urban areas, from Galati, Braila, Tecuci, Iasi, Husi, Suceava, Dej, Focsani, Baicoi, Marasesti.

The questionnaire was applied between November and December 2019 and was distributed both in written formand online through Google Forms.

In order to present the results of the questionnaire, we will analyze the answers to the questions of the conducted study. In addition to general questions aimed at the physical education discipline, this questionnaire also includes questions that refer to the cognitive area, to the contents of the physical education lesson and their influences, and questions aimed at the influence of the physical education discipline on the cognitive development of students and the increase in school efficiency.

In the research approach associated with the realization of the study within the ascertaining experiment, we carried out a sociological survey, which allowed us to analyze and draw some conclusions, derived from the interpretation of the answers provided. The opinions of specialists in the field of physical education, as well as those of other specializations, have contributed to confirming the importance of developing coordinative skills at a young school age in order to develop harmoniously both from a physical, motor and mental point of view.

Thus, from the analysis of the answers obtained, we observe that *the level of school physical education in Romania is average*, teachers specializing in physical education responded in this way in proportion to 57%, and teachers with other specializations in proportion to 64%. (fig. 1)

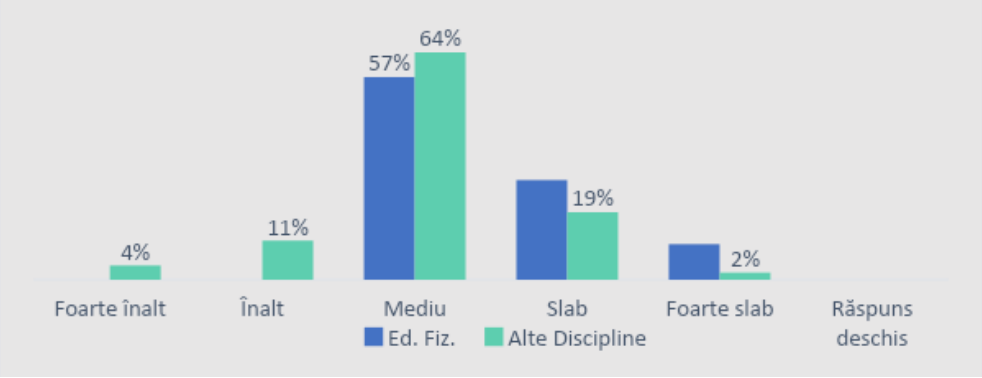


**Fig. 1. Graphical representation of the results obtained in question no.1**

*All school ages require increased attention regarding the organization of physical education*, thus answering 69% of physical education teachers and 78% of those with other specializations. *the*

*level of physical training of pupils included in the primary cycle of education* it is a medium one, 37% physical education and 65% other specializations. Those surveyed are of the opinion that *2 hours of physical education per week is not enough for an adequate physical training of primary school pupils* 80% physical education and 66% other specializations.

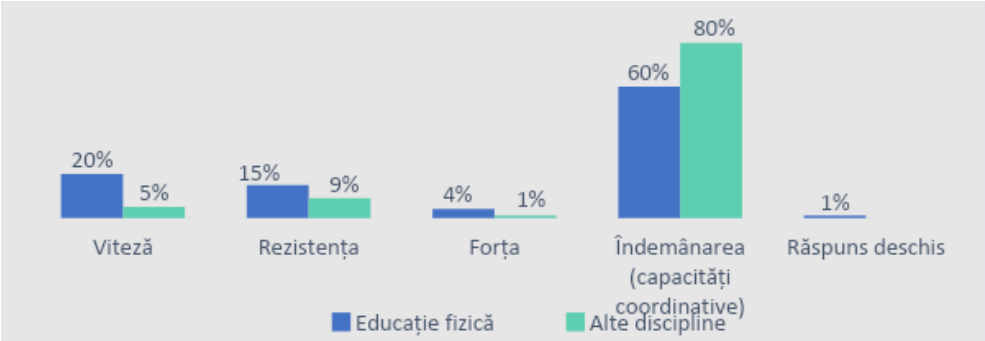


**Fig.2 Graphical representation of the results obtained in question no.10**

We notice that the pupils' cognitive area is influenced (fig. 2),in proportion to 47% of motor qualities from the point of view of physical education teachers and 68% of teachers with other specializations opted for the same choice. We also found out that teachers agree, in proportion to 97%, for both categories of respondents, that we can influence the school performance of the pupils through the content of the physical education lesson.

In conclusion, we can say that following the interpretation of the collected data, we obtained valuable information regarding the organization of the training process regarding the discipline of physical education and its role in increasing the school performance of pupils.

It is gratifying that the vast majority of respondents, teachers from pre-university education, expressed their opinion about the positive influence of physical education on improving cognitive abilities and increasing academic performance.

The basic objective in the ascertaining experiment was determining the age stage for young schoolchildren, i.e. grades I - IV, in which the forms of manifestation of coordination skills manifest themselves more obviously. In this stage, we will analyze the evolution of the performance of the coordinative skills, by differentiating the results obtained by the pupils, in order to determine the age stage in the primary level of education, in which the coordinative skills manifest themselves more obviously. Most specialists in the field assert that the 9-10 year age stage is the optimal stage. Thus, in the present study we try to see if in practice at this age stage, the coordinative capacities.

In table no. 2, the arithmetic averages are centralized for each of the tests carried out, conducted for the evaluation of the development level of the coordinative skills, manifesting more obviously.

Analyzing the dynamics of the indices obtained in the tests for the forms of manifestation of the coordinative skills, we can conclude that they manifest themselves most obviously in the age stage of 9-10 years, respectively in the 3 rd grade pupils, from the primary level of education.

Another important objective is to capture the dynamics of the evolution of school performance of primary school pupils in an attempt to identify the optimal periods, but also the vulnerable ones in the acquisition of information, knowledge, skills during a school year.

**Table no. 2 The evolution of arithmetic averages of coordination skills**

| The title of the test | Coordinative skills | Grade I | Grade II | Grade III | Grade IV |
|---|---|---|---|---|---|
| Romberg test (sec.) | Maintaining balance | 15.85 | 19.03 | 23.07 | 21.67 |
| Matorin (degree) | | 188.20 | 258.20 | 291.38 | 248.10 |
| Tapping Test (pct) | Sense of rhythmicity | 30.96 | 33.17 | 48.16 | 47.62 |
| Target sprint pace (sec.) | | 2.02 | 1.95 | 1.65 | 2.44 |
| Distance assessment test (cm) | Orientation in space | 204.16 | 183.87 | 91 | 101.20 |
| Hexagon Test (sec.) | | 38.10 | 34.97 | 25.57 | 31.72 |
| Square test (sec) | Assessment and regulation of dynamic and spatio-temporal parameters | 16.23 | 13.52 | 12.48 | 11.51 |
| Carry. basketballs (sec.) | Coordination of movements | 18.56 | 19.25 | 14.87 | 14.3 |
| Inter-pluri-seg coordination | | 7.64 | 7.87 | 9.67 | 8.08 |

The objective of the study is to determine the evolution of the pupils' academic performances, the favourable periods for influencing them, as well as the evaluation of school results in the dynamics of the primary education cycle.

The study was carried out on a number of 111 female and male pupils, from the primary education level of the "Mihail Sadoveanu" Secondary School, Galati. The evaluation of the academic performance of the subjects was carried out in June 2018, after the end of the teaching situations and consists in recording the qualifications obtained by students of grades I-IV in 4 subjects from different curricular areas: Romanian, Mathematics, English and physical education for the 2017-2018 school years.

The interpretations performed in the study were broken down by semester and gender in each of the disciplines listed above. In the study, only one grade participated on each level, namely 1st grade 25 pupils (9 girls and 16 boys), 2nd grade 30 pupils (12 girls and 18 boys), 3rd grade 25 pupils (10 girls and 15 boys) and 4 $^{th}$ grade 31 pupils (19 girls and 12 boys).

In the primary cycle of education, for school performance, pupils are given grades as follows: VG - very good, G - good, S - sufficient and I - insufficient. In order to be able to calculate and interpret from a statistical point of view the results of the pupils in the present study, we resorted to the transformation of the qualifications into scores. Thus we awarded points for each qualification as follows: VG – 5p, G – 4p, S – 3p, I – 2p.

Obtained results

For each individual class, the average was calculated in each of the 4 disciplines mentioned above for each semester broken down by gender and mixed. Averages and other calculated statistical indicators are shown in the centralizing table below (table no. 3).

Analyzing the results obtained in each grade separately, we can say that in the 1st, 2nd and 4th grades the results obtained in the first semester are better than those in the second semester. In general, girls are more conscientious than boys, they obtain better results.

**Table 3 Evolution of averages calculated for the primary cycle of education**

| GRADES | Romanian | | | | | | Math | | | | | | English | | | | | | Physical education | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | SEM I | | | SEM II | | | SEM I | | | SEM II | | | SEM I | | | SEM II | | | SEM I | | | SEM II | | |
| | B | G | M | B | G | M | B | G | M | B | G | M | B | G | M | B | G | M | B | G | M | B | G | M |
| I | 5,00 | 4,97 | 4,98 | 4,78 | 4,49 | 4,59 | 5,00 | 5,00 | 5,00 | 4,59 | 4,54 | 4,56 | 5,00 | 5,00 | 5,00 | 5,00 | 5,00 | 5,00 | 5,00 | 4,93 | 4,96 | 5,00 | 4,91 | 4,94 |
| II | 4,25 | 4,31 | 4,28 | 4,46 | 4,58 | 4,53 | 4,44 | 4,68 | 4,58 | 4,36 | 4,38 | 4,37 | 4,81 | 4,79 | 4,80 | 4,83 | 4,75 | 4,75 | 5,00 | 4,92 | 4,95 | 4,97 | 4,85 | 4,91 |
| III | 4,96 | 4,77 | 4,85 | 4,96 | 4,83 | 4,88 | 4,86 | 4,75 | 4,79 | 4,94 | 4,73 | 4,82 | 4,90 | 4,76 | 4,81 | 5,00 | 5,00 | 5,00 | 5,00 | 4,97 | 4,98 | 5,00 | 4,97 | 4,98 |
| IV | 4,83 | 4,69 | 4,78 | 4,47 | 4,46 | 4,47 | 4,55 | 4,55 | 4,55 | 4,22 | 4,33 | 4,26 | 4,72 | 4,72 | 4,72 | 4,47 | 4,17 | 4,35 | 4,98 | 4,88 | 4,72 | 4,91 | 4,83 | 4,88 |
| $\bar{x}$ | 4,76 | 4,69 | 4,72 | 4,67 | 4,59 | 4,62 | 4,71 | 4,75 | 4,73 | 4,53 | 4,50 | 4,50 | 4,86 | 4,82 | 4,83 | 4,82 | 4,73 | 4,78 | 5,00 | 4,93 | 4,90 | 4,97 | 4,89 | 4,93 |

The weaker results obtained in semester II can be attributed to the fatigue accumulated by the pupils during the entire school year. Grade III is the only class that obtained better results in the second semester than in the first semester. Regarding the connection between Romanian Language, Mathematics, English Language and Physical Education we can say that the pupils who have lower results in the theoretical subjects have the same results in Physical Education, these being caused by the low interest in accumulating new knowledge, but also in exerting physical effort.

**The experimental curriculum focused on the development of coordinative skills**

The discipline of physical education and sport represents a field of particular importance for primary school pupils. This discipline is provided in the curriculum and benefits from a number of two hours in the common core, and the lesson represents the main form of organizing the practice of physical exercise in school physical education.

In the elaboration of the experimental program for the development of coordinative skills, a certain sequence was taken into account in the application of the means, for the entire structure of the physical education lesson. Schematically, this model is shown in figure 3.

The development of coordinative skills can be approached within formal education (during the school curriculum), as well as in non-formal activities (motor activities during free time), therefore in any of the organization forms of practicing physical exercises. It should also be stated that the development of coordinative skills can be achieved throughout the physical education class, not only in the first thematic link and in several stages, as follows:

In the *first stage* the action systems used consist of simple exercises, known by the pupils, segmental or global and which do not exert additional pressure on them. It is recommended that the exercise be done without time pressure, with medium intensity, low workload and low complexity. The practice can be done individually, in groups or teams, and the time allocated will not exceed 20% of the total time allocated to the thematic link. The greater the automation of these drive systems, the more the number of subjects involved in simultaneous practice.

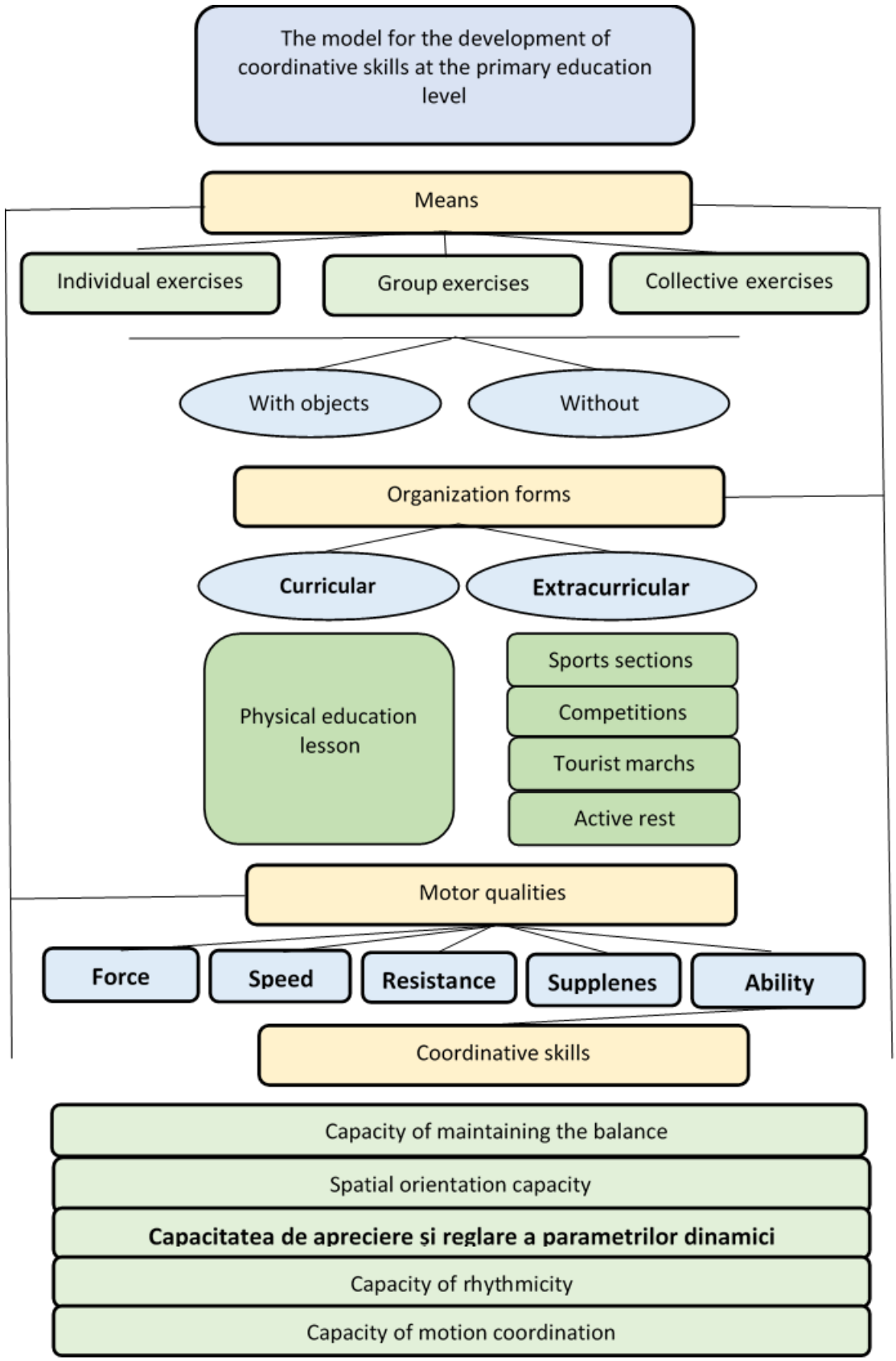


**Fig. 3 The experimental program for the development of coordinative skills**

*The second stage*, in which the means used previously are resumed, but we work with time pressure, the volume, intensity and complexity remain at the level of those of the first stage. The allocated working time does not exceed, even at this stage, 20% of the total time allocated to the respective link.

In *the third stage* it is necessary to modify the internal structure of the respective exercise, or/and to modify the external conditions of exercise. It is not recommended that these changes be introduced simultaneously. It is recommended to initially modify the internal structure of the movement, followed by the modification of the exercise conditions. In this stage the complexity will increase compared to the previous stages. The time allocated can reach up to 60% of the time budget allocated to the thematic link.

In the *fourth stage it* calls for the chaining of several acts/motor actions that have been automated separately and making the conditions of execution more difficult, an action that leads to an increase in complexity, and the time allocated can reach up to 60% of the time related to the respective link. The exercise will be done individually or in groups of pupils as small as possible.

*The fifth stage* it is identical to the fourth one, but it is worked under time pressure. The degree of complexity is high, and the time allocated can reach up to 60% of the time allocated to the respective link.

When we talk about coordination, another important aspect is "genetic inheritance", which plays an essential role, and must be taken into account. We must also specify that the development of coordination is a difficult process, based on imagination, diversity and adaptability.

In conclusion, a series of development methods have been established for the other capacities of the individual, but for the education of coordination we cannot say that we have a specific method.

Considering the aforementioned, in the physical education and sports lesson we acted as follows:

- *in the organizational part* we used games, especially attention games with different visual and auditory commands, made in the form of a competition between groups or individually, as means for the development of coordinative skills. Emphasis is placed on the variation of the exercises as a structure, competitions between groups are carried out with an emphasis on the correctness of the execution, thus requiring the concentration of attention and reaction speed. By using them, we aimed to regulate the dynamic parameters, spatio-temporal orientation, static balance;
- *within the second link,* we acted with means from the school of running, jumping, but also simple exercises for engaging the main segments of the body, performed on standing position, while walking or mixed, with short and active breaks. In this link, the development of static and dynamic balance, spatio-temporal orientation, regulation of dynamic parameters and coordination of movements was pursued;
- for *the third link* analytical exercises of selective influence, specific to all segmental and muscle groups, were used as actuation systems. The motor density is determined by the number of repetitions, rhythm and duration of breaks. In order to achieve variety, the content of the exercise complexes, work formations and forms of exercise will be changed periodically. The attractiveness

is obtained by alternating free exercises with objects or in pairs, but also with musical background. For this link, inter pluri segmental coordination, balance, sense of rhythmicity was considered;

- *links four and five* are thematic links aimed at achieving the contents of the planned learning units. Depending on the specifics of the learning unit addressed (motor qualities or skills), exercises of variable complexity will be used, which will lead to the achievement of the established objectives. The actuation systems will be adapted to the level of pupils training. The density is achieved through a large number of materials and installations, which will allow the organization of the practice. Variety is created by changing the structures of the exercises used and the forms of exercise. Attractiveness is achieved through games and relays, bilateral games. Within these thematic links, all forms of manifestation of the coordinative skills can be considered;

- *the sixth link,* responsible for the body's recovery after exertion, is carried out with low intensity, through easy walking and running, but also attention-grabbing games. For variety, the exercises used will be changed periodically. The attractiveness lies in the pupils' understanding of the need for the body to recover after exertion. For this link, balance and segmental coordination were taken into account;

- the concluding part considers the change from one lesson to another in the way of presenting the conclusions and recommendations.

## 3. EXPERIMENTAL ARGUMENTATION OF THE INFLUENCE OF THE COORDINATIVE SKILLS DEVELOPMENT ON THE ACADEMIC PERFORMANCE OF PRIMARY SCHOOL PUPILS

The problem of the coordinative skills approach by specialists in the field of physical education and sports is so complex, that it is well known that they are found in all aspects of modern man's life.

Regarding the current school curriculum for the discipline of physical education for the primary level of education, there are specifications that refer to the development of these capacities, but the need for their development is not highlighted. The remarks we mentioned before refer to coordination, which is found in the program, especially in all the technical procedures specific to some sports branches, but is not developed separately through specific means in order to develop the motor capacity. Because of this, the pupils' motor performance is not at a higher level either. Coordination can be found in all basic motor skills, which are the basic link of the adaptation and integration of the individual in the environment.

In the preliminary research, working for the development of coordinative skills, we observed the positive evolution of the school performance, but also a real improvement in the social behaviours of the pupils included in the experiment, behaviours observed with great enthusiasm also by the primary education teachers who teach at this class.

The purpose of this research is to introduce new means that act effectively in order to develop coordinative skills, with real influences on school performance, but also the development of emotional intelligence, which seems to be the basis of success of any kind (school, social, integration in society, etc.).

The scientific problem is aimed at approaching the physical education lesson from the perspective of the predominant use of the means for the development of coordinative skills, in primary school pupils. The research demonstrate that, the rational management of these means within the physical education class, determines a higher level of manifestation of the coordinative skills and implicitly of the motor performance, leading to a better achievement of the objectives of the lesson.

The sample of subjects to be evaluated:

- experimental group - 3rd grade B, with a total of 31 pupils, 16 girls and 15 boys;
- control group - 3rd grade A, with a total of 27 pupils (15 girls and 12 boys);

The activity was directed towards the development of coordinative skills and the achievement of the objectives for the discipline of physical education and sport, according to the school curriculum, was carried out in sports hall of the "Mihail Sadoveanu" Secondary School in Galati. Both subjects in the experimental group and those in the control group attended physical education classes 2 times a week. It must be stated that the pupils in the control group performed the usual physical education classes respecting the current school curriculum.

**The dynamics of motor training indices of primary school pupils**

According to the school curriculum at the primary level, physical training is one of the main factors related to the assessment of the level of acquisition of the given discipline. In fact, this is also a basic objective of school physical education, including for primary school pupils. Implementing the experimental program focused on the targeted development of coordinative skills, we were particularly interested in how the other indicators of the motor training of 9-10-year-old pupils evolved. In this regard, we applied three tests that demonstrate the level of development of speed capabilities (25m run), strength in speed mode (standing long jump) and skill (throwing the oina ball). The recorded results were processed statistically and are presented in table 4.

In order to check whether the performances of the pupils included in the experiment differ significantly in the initial testing and those in the final testing, we applied the "t-Test" to compare the averages of two paired samples, which can be used to assess the differences between two average values or proportions , if the number of individuals in the sample is small. The related calculations were made with the help of the Excell program from the Microsoft Office package and the IBM SPPS Statistics version 26 program, through which we calculated the following indicators specific to our research field: arithmetic mean; standard deviation; coefficient of variability; "t" test of significance of difference between means.

Comparing the values obtained with the value of "t" from Fisher's table related to the number of cases in the column f = n - 1, (31-1 for the experimental group and 27-1 for the control group), it is observed that the differences are significant with certainty 99% ,$p < 0.001$.

**Table 4 Indicators of the development of the motor capacities of primary school pupils participating in the pedagogical experiment (mixed) (n=58)**

| No. crt. | Motor TESTS | Groups and statistical indicators | Statistical indicators | | | |
|---|---|---|---|---|---|---|
| | | | TI $\bar{x} \pm m$ | TF $\bar{x} \pm m$ | t | P |
| 1. | Speed running 25 m (sec) | EG | 5,90±0,45 | 5,64±0,48 | 12,64 | <0,001 |
| | | CG | 5,93±0,42 | 5,79±0,37 | 4,01 | <0,001 |
| | | t | 0,23 | 1,40 | - | - |
| | | P | >0,05 | >0,05 | - | - |
| 2. | Standing long jump (cm) | EG | 127,74±19,26 | 137,77±19,09 | 12,42 | <0,001 |
| | | CG | 127,15±22,69 | 132,63±21,89 | 11,39 | <0,001 |
| | | t | 0,11 | 0,95 | - | - |
| | | P | >0,05 | >0,05 | - | - |
| 3. | Throwing the oina ball (m) | EG | 16,63±4,55 | 18,62±4,36 | 9,27 | <0,001 |
| | | CG | 16,46±4,03 | 17,34±4,24 | 6,65 | <0,001 |
| | | t | 0,15 | 1,13 | - | - |
| | | P | >0,05 | >0,05 | - | - |

Note: EG – Experimental group, n= 27; CG - Control group, n= 31

| P | 0,05 | 0,01 | 0,001 |
|---|---|---|---|
| f= 26 | 1,706 | 2,779 | 3,707 |
| f= 30 | 1,697 | 2,750 | 3,646 |
| f= 56 | 2,021 | 2,704 | 3,551 |

Analyzing the results of the evolution of the motor tests, it was demonstrated that the implemented experimental program had a positive impact on the development of the motor capacity necessary for primary school pupils, even in some cases it develops quite difficult.

We continue with the presentation of the analysis of the development indices of the coordination skill of the 9-10 year-old pupils participating in the pedagogical experiment.

**The evolution of the indices of the coordinative skills development of the pupils in the primary level of education**

Coordinative skills have a wide applicability in everyday life, but also in the motor activity during the physical education class, which means that they are native and perfectable qualities if they are acted on selectively, continuously and as early as possible.

A group of 10 tests was used for the assessment of the developing coordination skills for the following forms of manifestation:

- ✔ They were used *the hexagon test* and *the distance judgment test* to assess and regulate the dynamic and spatio-temporal parameters of the motor act;
- ✔ Balance maintenance has been tested through *Flamingo* and *Matorin* tests;
- ✔ The sense of rhythmicity was tested with the help of *tapping test* and *sprint tests at the proposed pace*;
- ✔ The adjusting of the dynamic parameters was tested by means of *the ball running test and the square test;*

✔ Movement coordination was tested through *inter pluri segmental coordination* and *carrying the basketball* tests.

The results obtained by the experimental and control groups, for each of these samples, are shown in table 5.

**Table 5 Analysis of indices of pupils' coordinative skills from primary classes (mixed) (n=58)**

| No. crt. | Specific motor tests | Groups and statistical indicators | Statistical indicators | | | |
|---|---|---|---|---|---|---|
| | | | TI $\bar{x} \pm m$ | TF $\bar{x} \pm m$ | t | P |
| 1. | The hexagon test (sec) | EG | 14,79±3,19 | 14,31±3,25 | 5,13 | <0,001 |
| | | CG | 14,56±3,13 | 14,07±3,19 | 4,59 | <0,001 |
| | | t | 0,28 | 0,27 | - | - |
| | | P | >0,05 | >0,05 | - | - |
| 2. | Distance assessment test (cm) | EG | 2,13±0,53 | 1,47±0,44 | 5,32 | <0,001 |
| | | CG | 2,56±0,83 | 2,08±0,74 | 2,20 | <0,05 |
| | | t | 0,46 | 0,72 | - | - |
| | | P | >0,05 | >0,05 | - | - |
| 3. | Right Matorin test (degree) | EG | 259,35±66,94 | 325,65±58,06 | 12,35 | <0,001 |
| | | CG | 260,19±68,63 | 291,67±45,34 | 10,99 | <0,001 |
| | | t | 0,05 | 2,50 | - | - |
| | | P | >0,05 | <0,05 | - | - |
| 4. | Left Matorin Test (degree) | EG | 225,00±66,45 | 284,52±56,26 | 11,58 | <0,001 |
| | | CG | 226,67±69,70 | 245,37±60,89 | 10,18 | <0,001 |
| | | t | 0,09 | 2,53 | - | - |
| | | P | >0,05 | <0,05 | - | - |
| 5. | "Flamingo" test (pct) | EG | 2,68±0,91 | 1,42±0,56 | 9,61 | <0,001 |
| | | CG | 2,67±0,83 | 1,93±0,87 | 5,87 | <0,001 |
| | | t | 0,01 | 2,58 | - | - |
| | | P | >0,05 | <0,05 | - | - |
| 6. | Sprint at target pace (sec) | EG | 2,53±0,83 | 2,17±0,89 | 14,73 | <0,001 |
| | | CG | 2,50±0,79 | 2,24±0,84 | 4,14 | <0,001 |
| | | t | 0,14 | 0,33 | - | - |
| | | P | >0,05 | >0,05 | - | - |
| 7. | Tapping-test – choice I (pct) | EG | 40,69±8,55 | 47,49±8,21 | 10,7 | <0,001 |
| | | CG | 42,32±5,87 | 45,75±9,01 | 1,97 | <0,05 |
| | | t | 0,86 | 0,77 | - | - |
| | | P | >0,05 | >0,05 | - | - |
| 8. | The "square" test (sec) | EG | 12,23±3,65 | 11,75±3,33 | 4,66 | <0,001 |
| | | CG | 12,22±3,73 | 12,01±3,41 | 0,91 | >0,05 |
| | | t | 0,01 | 0,29 | - | - |
| | | P | >0,05 | >0,05 | - | - |
| 9. | Ball Running (sec) | EG | 15,52±2,13 | 15,15±2,09 | 12,32 | <0,001 |
| | | CG | 15,74±2,21 | 15,41±2,10 | 8,17 | <0,001 |
| | | t | 0,04 | 0,47 | - | - |
| | | P | >0,05 | >0,05 | - | - |

| | | | | | | |
|---|---|---|---|---|---|---|
| **10.** | Inter-pluri-segmental coordination test (pct) | EG | 7,58±1,09 | 9,44±0,74 | 10,06 | <0,001 |
| | | CG | 7,50±1,13 | 8,89±1,01 | 8,76 | <0,001 |
| | | t | 0,28 | 2,32 | - | - |
| | | P | >0,05 | <0,05 | - | - |
| **11.** | Carrying basketball (sec) | EG | 14,85±2,38 | 13,99±2,63 | 6,09 | <0,001 |
| | | CG | 14,74±2,43 | 14,36±2,50 | 3,06 | <0,01 |
| | | t | 0,17 | 0,55 | - | - |
| | | P | >0,05 | >0,05 | - | - |

Note: EG – Experimental group, n= 27; CG - Control group, n= 31

| P | 0,05 | 0,01 | 0,001 |
|---|---|---|---|
| f= 26 | 1,706 | 2,779 | 3,707 |
| f= 30 | 1,697 | 2,750 | 3,646 |
| f= 56 | 2,021 | 2,704 | 3,551 |

Analyzing the results of the coordination movement tests evolution, it was demonstrated that the implemented experimental program had a positive impact on the development of the forms of manifestation of coordination skills, a fact demonstrated by the statistically significant results. The statistical analysis of the results obtained within the pedagogical experiment of the implementation of the means for the development of coordinative skills in the final tests, in the experimental and control classes, were superior to the initial tests. Test values *„t"* shows significant values in the ten tests for the coordinative skills at P<0.05, P<0.01 and P<0.001 respectively.

**Analysis of the academic performance level of primary school pupils**

Academic achievement represents the grading of academic performance and shows the level of pupils' adaptation to academic tasks. An important role in highlighting school achievement is played by the teaching staff that must know the potential of each pupil, encourage them if necessary, in order to be highlighted as functional and engage them in learning activities. The development of the pupil's self-esteem, with a view to school achievement, is a long-term process, with numerous objective and subjective determinations. The school curriculum at the primary level indicates CLR along with MEM and English as basic subjects when it comes to evaluating school performance. The results obtained by primary school pupils from the pedagogical experiment for these subjects are shown in table 6.

The statistical analysis of the results obtained within the pedagogical experiment of implementing the means to influence school performance in the final tests for the experimental and control groups, were superior to the initial tests. Test values*"t"* presents significant values for the four disciplines analyzed for the assessment of school performance at P<0.001 for the experimental group due to the model of implementation of the specific means for the development of coordinative skills within physical education and sports lessons, at the final tests as follows:

CLR – experiment gr. t=8.2, P<0.001; MEM - experiment gr. t=7.71; English – experiment Gr. t=4.51, P<0.001; Physical education – experiment gr. t=7.11, P<0.001.

**Table 6 Analysis of school performance indicators of primary school pupils within the pedagogical experiment (n=58)**

| No. crt. | Measurements for determining school performance | Groups and statistical indicators | Statistical indicators | | | |
|---|---|---|---|---|---|---|
| | | | TI $\bar{x} \pm m$ | TF $\bar{x} \pm m$ | t | P |
| 1. | CLR | EG | 8,50±1,24 | 9,35±0,87 | 8,2 | <0,001 |
| | | CG | 9,07±0,82 | 9,13±0,95 | 0,4 | >0,05 |
| | | t | 2,11 | 0,94 | - | - |
| | | P | <0,05 | <0,05 | - | - |
| 2. | MEM | EG | 8,77±1,10 | 9,48±0,84 | 7,71 | <0,001 |
| | | CG | 9,11±1,08 | 8,91±0,91 | 1,7 | >0,05 |
| | | t | 1,18 | 2,49 | - | - |
| | | P | >0,05 | <0,05 | - | - |
| 3. | THE | EG | 9,18±0,98 | 9,6±0,57 | 4,51 | <0,001 |
| | | CG | 9,04±0,95 | ±9,28±0,86 | 2,47 | <0,05 |
| | | t | 0,55 | 1,64 | - | - |
| | | P | >0,05 | >0,05 | - | - |
| 4. | PHYSICAL EDUCATION | EG | 9,29±0,57 | 9,98±0,09 | 7,11 | <0,001 |
| | | CG | 9,54±0,52 | 9,57±0,55 | 0,35 | >0,05 |
| | | t | 1,72 | 3,83 | - | - |
| | | P | >0,05 | <0,001 | - | - |

Note: EG – Experimental group, n= 31; CG - Control group, n= 27

| P | 0,05 | 0,01 | 0,001 |
|---|---|---|---|
| f= 26 | 1,706 | 2,779 | 3,707 |
| f= 30 | 1,697 | 2,750 | 3,646 |
| f= 56 | 2,021 | 2,704 | 3,551 |

Following the application of the means system focused on the development of coordinative skills in physical education classes with primary school pupils, a series of particular conclusions were formulated:

The means applied in the pedagogical experiment had a positive effect on the level of motor training of 9-10 year old pupils, this being confirmed by the results recorded for several indicators.

The increase in the motor training indices of pupils is due to the mechanism of the positive transfer of motor qualities following the implementation of the experimental program focused on means for the development of coordinative skills.

The same trend is also observed in the case of the analysis of tests representing the level of developing coordinative skills, where we can conclude that the system of proposed means significantly influenced the development of coordinative skills, in all their forms of manifestation.

The implementation of the experimental program in the training process of primary school pupils in the discipline "physical education" had a positive impact on school performance in most

study subjects, a fact demonstrated by the accumulated score and the level of acquisition of the subjects of education for the respective age.

The value of the experimental program consisted in the application of action systems with a multilateral character, this aspect favoured the simultaneous education of motor capacities, improvement, but also a better control of strong emotional states (positive or negative), all of which have notable influences in improving school performance.

If we refer to the methodology of the experimental research approach focused on the development of coordinative skills in the primary level of education, especially for pupils aged 9-10 years, it was demonstrated that it was carried out in accordance with their somatic, functional, motor and mental peculiarities.

## GENERAL CONCLUSIONS AND RECOMMENDATIONS

Based on the conduct of this research with all the related stages: the study of the specialized literature, the organization of the research and the interpretation of the results obtained, through statistical processing we came to the conclusion that the development of coordinative skills presents benefits both in the physical and in the psychological sphere.

1. In accordance with the data of the specialized literature, we can appreciate that the development of the pupils' motor capacity by training the coordinative skills, transfers the beneficial effects also on the pupils' behaviour and the management of emotional states to a high degree. In other words, pupils will become more aware and engaged in all the activities they will carry out, through the transfer of cognitive-motor behaviours, both within the school and outside it.

2. The specialized literature proves to us that Intelligence represents a superior form of adaptation of the individual to new, problematic situations, by finding the answers in one's own experience. This experience is dependent on both internal and external factors. Likewise, intelligence is an accumulation of stable characteristics specific to each individual, appreciated by the quality of intellectual activity, with an emphasis on thinking. Under these conditions, the individual's cognitive adaptation to new situations occurs.

3. School success is the optimal alternative to school performance. This is given by the theoretical training, but also by the ability to put these notions into practice, with optimal efficiency. School achievement is expressed by marking with grades from 7 to 10 or with the qualifier "good" or "very good", as well as by obtaining awards and diplomas for activities carried out nationally, but also internationally of a practical nature: technical-scientific , cultural, artistic, sports, etc. Another important aspect of school achievement is given by the special qualities of the pupils' personality, embodied by: intellectual abilities (creativity, imagination, abstract thinking, logic), ability to adapt to the school and social environment, outstanding skills, the desire to overcome oneself and to perform, etc.

4. In the research approach associated with the realization of the study within the ascertaining experiment, we carried out a sociological survey, which allowed us to analyze and draw some conclusions, derived from the interpretation of the answers provided. The opinions of specialists in

the field of physical education, as well as those of other specializations, have contributed to confirming the importance of developing coordinative skills at a young school age in order to develop harmoniously both from a physical, motor and mental point of view.

Thus, from the analysis of the answers obtained, we observe that *the level of school physical education in Romania is average*, teachers specializing in physical education responded in this way in proportion to 57%, and teachers with other specializations in proportion to 64%.*All school ages require increased attention regarding the organization of physical education*, thus answering 69% of physical education teachers and 78% of those with other specializations. *the level of physical training of pupils included in the primary cycle of education* it is a medium one, 37% physical education and 65% other specializations. Those surveyed are of the opinion that *2 hours of physical education per week is not enough for an adequate physical training of primary school pupils* 80% physical education and 66% other specializations. We notice that *the cognitive area of pupils is influenced,* in proportion to 47% of motor qualities from the point of view of physical education teachers and 68% of teachers with other specializations opted for the same choice. We also learned that teachers agree, in proportion to 97%, for both categories of respondents, that *we can influence the school performance of the pupils through the content of the physical education lesson.*

5. The motricity tests in the preliminary experiment led to the following conclusions:

The knowledge of the level of general motor skills of primary school pupils was obtained on a sample of 111 pupils (one 1 st grade, one 2nd grade, one 3rd grade and one 4th grade each). According to the school curriculum at the primary level, physical training is one of the main factors related to the level of discipline mastery. In this sense, we applied three tests that demonstrate the level of development: speed capacities (running 25 m); strength in speed regime (standing long jump); skill (throwing the oina ball).

The results obtained by the research subjects in the general motor skills tests fit into the model of the biomotor potential for pupils included in this age stage.

6. The same number of subjects was tested for the evaluation of the development of coordination skills, a group of 10 tests was used for the following forms of manifestation:

- appreciation and regulation of the dynamic and spatio-temporal parameters of the motor act - the square test and the balls running test;
- maintaining balance – the Flamingo and Matorin test;
- the sense of rhythmicity – tapping test and sprint at the proposed pace;
- orientation in space – the hexagon test and distance assessment;
- coordination of movements – inter pluri segmental coordination and carrying the basketball.

In the case of control tests regarding the assessment of the level of developing coordinative skills, the obtained results confirm that a more elaborate approach to these skills is necessary in physical education classes, especially for young schoolchildren. It was also demonstrated that the pupils in the age group of 9-10 years old (3rd grade) achieved more obvious performances for coordinative skills, but also a constant evolution of school results.

7. The methodology approached throughout the research period within the instructive-educational process, for the development of coordination skills in the 9-10 years age stage, was in

full agreement with the motor, somato-functional potential and the level of previous acquisitions of the experimental group members. The statistical analysis of the results obtained within the pedagogical experiment of the implementation of the means for the development of coordinative skills in the final tests in the experimental and control classes, were superior to the initial tests. Test values*,,t"* shows significant values in the ten samples for the coordinative skills at P<0.05, P<0.01 and P<0.001 respectively. The superior results were obtained by the experimental class, thanks to the model of implementation of specific means for the development of coordinative skills within physical education and sports lessons, as follows:

- The hexagon test - experiment gr. t=5.13, P<0.001 and control gr. t=4.59, P<0.001;

- The distance assessment test - experiment gr. t=5.32, P<0.001 and control gr. t=2.20, P<0.05;

- Matorin test right - experiment gr. t=12.35, P<0.001 and control gr. t=10.99, P<0.001;

- Matorin test left - experiment gr. t=11, 58, P<0.001 and control gr. t=10.18, P<0.001;

- The Flamingo test – experimental group t =9.61, P<0.001 and control group t =5.87, P<0.001;

- The Sprint test at the target pace – experimental group t =14.73, P<0.001 and control group t =4.14, P<0.001;

- Tapping test – experimental group t =10.7, P<0.001 and control group t =1.97, P<0.05;

- The square test – experiment gr. t =4.66, P<0.001 and control gr. t =0.91, P>0.05;

- the balls running test – experimental group t =12.32, P<0.001 and control group t =8.17, P P<0.001;

- Inter pluri segmental coordination test - gr. experiment t= 10.06, P<0.001 and control group t=8.76, P<0.001;

- carrying the basketball test - experimental group t=6.09, P<0.001 and control group t=3.06, P<0.01;

8. The statistical analysis of the results obtained in the pedagogical experiment of implementing the means to influence school performance in the final tests for the experimental and control classes, were superior to the initial tests. Test values*"t"* shows significant values for the four disciplines analyzed for the assessment of school performance at P<0.05, P<0.01 and P<0.001 respectively. Superior results were obtained by the experimental class due to the model of implementation of specific means for the development of coordinative skills within the physical education and sports lessons, at the final tests as follows:

CLR – experiment gr. t=8.2, P<0.001 and control gr. t=0.4, P>0,05;

MEM - experiment gr. t=7.71, P<0.001 and control gr. t=1.7, P>0,05;

English – experiment Gr. t=4.51, P<0.001 and control gr. t=2.47, P<0.05;

Physical education – experiment gr. t=7.11, P<0.001 and control gr. t=0.35, P >0,05;

9. We can conclude that, for a better efficiency of physical education lessons, it is necessary to know the collectives of pupils, what motivates them, brings them gratification and what are the training methods most loved by them. Of course, in the organization and conduct of lessons, we cannot be guided only by the pupils wishes, but they will represent points of reference in the

selection of appropriate pedagogical methods and means for each individual group. Also, the game learned correctly in the gym, beneficially influences the individual during the whole life, by the fact that it accustoms them to bear the defeats but also to enjoy the victories. These aspects learned in the educational environment will be fruitful later in life. It is also through movement games that moral qualities such as perseverance, courage, the spirit of sacrifice, will, self-control are cultivated, but also human personality traits are developed. In these situations, the presence of the teaching staff aims to resolve and prevent conflicts, thus negative traits are corrected and transformed into qualities.

In the research process we were conditioned by certain limits that were given by the school curriculum, and the anatomical and psychological development peculiarities of the pupils. These created visible differences between pupils at the same age stage, because, as the specialized literature tells us, chronological age does not always correspond to biological and psychological age.

Since there are obvious links between the optimal development of coordinative and cognition skills, this could be the strength of the field of physical education and this discipline could gain the same importance in society's perception as other disciplines. Given these arguments, an increased number of hours per week of physical education would be fully justified.

In this way, the important scientific problem solved is analysis of the situation regarding the content of physical education at primary education level in Romania, which highlighted a series of problems related to the low level of physical training and development of pupils of the given age. Speaking about physical training, i.e. the level of development of motor qualities, it has been demonstrated that, compared to other basic qualities, coordination skills are developed at a rather low level, and their directed development could positively influence both the level of training and physical development, as well as school performance in general.

***

The use of physical exercises in order to increase the capacity to relax, activate, organize or concentrate psychic energy is a common practice for modern man. Numerous methods use movement for psychotherapeutic - corrective purposes, for optimization more recent ones, such as behavioural therapies or modern relaxation techniques. Also, mental degradation is prevented or the pace of its installation is much slower under conditions of optimal motor demand, along with intellectual and social demands.

For the proper development of coordination skills within the instructional-educational process, the following aspects will be taken into account:

✔ Coordinative skills condition the learning and improvement of newly acquired motor acts/actions;

✔ A high level of manifestation of the coordinative skills allows the performance of motor acts/actions in varied conditions, the capitalization at a higher level of the other motor capacities, allows the performance of motor acts/actions in optimal conditions of rhythm and time;

✔ It is recommended to avoid physical exercises that cause damage to muscles or joints;

✔ It is recommended to hold a large number of lessons with the objective of developing different forms of manifestation of the coordinative skills, but with a small volume of effort in the lesson.

In order to regulate emotions within the instructional-educational process, we must be aware of the following aspects:

✔ To improve emotional states, finding relevant arguments is essential;

✔ Activities that bring satisfaction, creating a pleasant atmosphere in the classroom are recommended in the instructive-educational activity;

✔ Guiding pupils in finding solutions for problems that generate negative emotions, and making them aware that what they think in a certain situation influences their behaviour;

✔ Activities in which pupils can experience a wide range of emotions (positive and negative), which they can recognize and understand in order to cope with them, are recommended;

✔ Emotional realities supports pupils, by offering a more realistic perception of life;

✔ The valorisation of the physical education lesson in the sense of creating a strong connection between the cognitive, emotional and motor spheres.

✔ By using means suitable for each age stage we work with, we can also get rid of the refusal of pupils with less motor skills to participate in a certain activity for the simple reason that it seems too difficult. At early school age (9-10 years old), our recommendation is that game be used as the main means of practice. The game has a therapeutic effect and works by "hypnotizing" the participants. Pupils in general, but especially those in the primary grades, are so attracted to the game with the rules that they don't think about how difficult the requirement of the teaching staff is. This aspect once again proves the interrelationship between the psycho-motor and psychic intellectual capacity of the human being.

✔ For the proper development of intelligent motor behaviour, with real chances of transferring this behaviour to the classroom, namely to other subjects in the pupils' school curriculum, systematic work, imagination and involvement on the part of the teaching staff is needed, but also active pupils participation and conscious.

✔ The motor activities, but especially the physical education lessons, will be designed in such a way as to constantly reveal problematic situations, which will demand from the pupils the elaboration of new ideas to solve them, so that mental processes such as: creative thinking, attention, memory, using physical exercise as the main means. This mode of action is an asset that the physical education teacher possesses, which can be used to achieve any educational objective, not only the objectives of physical education, therefore we believe that we can say that physical education is an "interdisciplinary" discipline ".

## References:


1. ATKINSON, R.C., HILGARD, E.R. *Introducere în psihologie*. București: Tehnică, 2005. 620 p., 629 p., 634-636 pp., 647 p. ISBN 973-31-2253-X.

2. BAȘTIUREA, E. *Handbal. Concepte, principii și căi de perfecționare ale antrenamentului*. Galați: Academica, 2007, 90 p., 94-95 pp. ISBN 978-973-8937-31-4.

3. BĂBAN A. *Consilierea educațională. Ghid metodologic pentru orele de dirigenție și consiliere*. ed. a 3-a. Cluj – Napoca: ASCR, 2014. 294 p. ISBN 978-973-7973-65-8.

4. BOMPA, T.,O. *Periodizarea: Teoria și metodica antrenamentului*. ed. a V-a, (trad.), București: Tana, 2014. 416 p., 467 p. ISBN 978-973-1858-68-5.

5. BOTA, A., ȘERBĂNOIU, S. *Teoria Educației fizice și sportului*. București: Cartea Școlii, 2000. 9 p. ISBN 973-98138-5-2.

6. BADIU, T., BADIU, G., CIORBĂ, C. *Educația fizică a copiilor și școlarilor. Metode și mijloace*, Chișinău: Garuda – Art, 1999. 16 p. ISBN 9975-9564-0-8.

7. CÂRSTEA, Gh. *Teoria și Metodica Educației Fizice și Sportului*. București: AN-DA, 2000. 10 p. ISBN: 973-99256-6-9.

8. CHIRIȚĂ, G. *Optimizarea lecției de educație fizică*. București: Stadion, 1972. 9 p.

9. COCORADĂ, E. *Psihologia educației, curs pentru anul I*. [online] Brașov, 2011. [citat 01.03.2021]. Disponibil: https://www.slideshare.net/RaduFlorentina1/psihologia-educatieiecocorada.

10. COLIBABA, E.D., BOTA, I. *Jocuri sportive – teorie și metodică*. București: Aldin, 1998. 328 p. ISBN: 973-98005-4-8.

11. DAVITZ, J.R., BALL, S. *Psihologia procesului educațional*, (trad.), București: Didactică și Pedagogică, 1978. 21-22 pp.

12. DRAGNEA, A., BOTA, A., *Teoria Activităților Motrice*. București: Didactică și Pedagogică R.A., 1999. 8 p., 25 p., 33 p., 34 p., 41 p., 43 – 45pp., 47 p., 48 p., 63 p., 107 p., 137-138 pp., 242-243 pp. ISBN 973-30-9721-7.

13. DRAGNEA, A., TEODORESCU, S. *Teoria sportului*. București: 2002. 353-354 pp. ISBN: 973-85143-3-9.

14. DRAGU, M. *Jocuri de mişcare*, Galați: Academică, 2006. 28 p.

15. FIRIMIȚĂ, M. *Exercițiul fizic – un valoros medicament natural*. vol. II, București: Ceres, 1981. 19 p.

16. GHIMP, A., BUDEVICI-PUIU, A. *Teoria și metodica jocurilor dinamice*. Chișinău: Valinex, 2016. 480 p. ISBN 978-9975-68-294-7.

17. JURAT, V. Structura şi conținutul pregătirii specialiștilor în domeniul culturii fizice şi a sportului în diverse instituții superioare de învățământ. În: *Probleme acmeologice în domeniul culturii fizice: Conferința științifică internațională*. Chișinău: USEFS, 2016, 36-42pp. ISSN: 1582-2168.

18. LASCĂR, S. *Iuvernal, Satire*. (Trad.), București: Tineretului, 1966. 108 p.

19. MANNO, R., *Bazele antrenamentului sportiv*, București: Centrul de Cercetări pentru Probleme de Sport, 1996. 139 p. ISBN 2-86713-082-4.

20. MOMANU, M. *Introducere în Teoria Educației*. Iași: Polirom, 2002. 104 p., 110 p. ISBN 973-681-099-2.

21. NEACȘU, I. *Neurodidactica învățării și psihologia cognitivă. Ipoteze. Conexiuni. Mecanisme.* , Iași: Polirom, 2019. 129p., 216 p., ISBN 978-973-46-7849-5.

22. NICOLA, I. *Pedagogie școlară*, București: Didactică și Pedagogică, 1980. 199 p.

23. NICOLA, I. *Teoria educației și noțiuni de cercetare pedagogică*. București: Didactică și Pedagogică, 1990.

24. NICOLA, I. *Tratat de pedagogie școlară*. București: Didactică și Pedagogică, 1996. 60 p., 297 p. ISBN 973-30-4683-3.

25. RAȚĂ, G., RAȚĂ, Gh. *Educația fizică și metodica predării*. Ed. a II-a revăzută și modificată, Iași: Pim, 2008. 128p.,175p. ISBN 978-606-520-041-8

26. ȘICLOVAN, I. *Teoria educației fizice și sportului*. București: Sport-Turism, 1979. 95 p. 107 p. 234-235 pp.

17. TUDOR, V. *Măsurare și evaluare în cultură fizică și sport*. București: Alpha, 2005. 78 p., 81-82 pp. ISBN 973-7871-24-3.

28. VERZA, E., *Psihologia vîrstelor*. București: Hyperion XXI, 1993. 68-77 pp. ISBN 973-96161-3-5.

29. BELLEAU, J. *Neuropedagogie: cerveaux, intelligences et apprentissage*. [online] aprilie 2015 [citat 12.08.2021]. Disponibil: https://cdc.qc.ca/pdf/033201-belleau-neuropedagogie-cerveau-intelligences-apprentissage-2015.pdf.

30. BUFTEA, V., JURAVLE, M. The power of being competent or competence as power. In: Trends and perspectives *in physical culture and sports: intern.scientific conf. VInded*. 26-27 *may 2016*. Suceava, 2016. 204-205 pp.. ISSN 2065-3948;

31. **BURLUI R.M.**, MOISESCU P.C. The role of physical education in well-being and school performance of pupils. In: *Știința Culturii Fizice*. Nr. 38/2–2021, 139-148 pp. CZU: 373.037.1:37.03, Disponibil: https://doi.org/10.52449/1857-4114.2020.38-2.09;

32. Hackfort Dieter, Health and Wellness: a Sport Psychology Perspective. În: *8-th World Congress Sport Psychology*, Lisbon, p.92-103; Disponibil: https://archive.org/details/internationalper0000unse_g5s0/page/n7/mode/2up

33. MOISESCU, P.C., **BURLUI, R.M**. Study of the developement of educational performance of students in the primary cycle of education. [online]. In: *Gymnasium Scientific Journal of Education, Sports, and Health*. Bacău, România, 2018, Vol. XIX(2), [citat 23.04.2020]. 50-62 pp. DOI: 10.29081/gsjesh.2018.19.2.05. Disponibil: http://www.gymnasium.ub.ro/index.php/journal/article/view/522/706;

34. MOISESCU, P.C., **BURLUI, R.M.** Study on the influence of coordinating capacities on motor performance students in primary cycle of education. [online]. In: *S. Marin & P. Moisescu (vol. eds.), Lumen Proceedings: Vol. 12. 4th International Scientific Conference SEC-IASR 2019*, 2020, Iasi, Romania: LUMEN Publishing House. [citat 23.05.2021]. 264-273 pp. Disponibil: https://doi.org/10.18662/lumproc/sec-iasr2019/28

35. MOISESCU, P.C., **BURLUI, R.M**. The perception of physical education in the romanian educational system. [online]. In: *Bulletin of the Transilvania University of Braşov, Series IX: Sciences of Human Kinetics.* 2019, Brașov, România Vol. 12(61) No. 2, [citat 29.08.2021]. 113-122 pp. Disponibil: https://doi.org/10.31926/but.shk.2019.12.61.2.46

36. MOISESCU, P.C., **BURLUI, R.M.** Emotional intelligence, a key factor in pupils' school performance. [online]. In: *Gymnasium Scientific Journal of Education, Sports, and Health*. Bacău, România, 2020, Vol. XIX,(2) Supplement, [citat 29.08.2021]. 97-110 pp. Disponibil: DOI: https://doi.org/10.29081/gsjesh.2020.21.2s.08

# ADNOTARE

Burlui Raluca Mădălina *„Dezvoltarea capacităților coordinative și influența acestora asupra performanței școlare la nivel de învățământul primar”:* Teză de doctor în științe pedagogice. Chișinău, 2023

**Structura tezei:** Introducere, 3 capitole, concluzii și recomandări, 223 surse bibliografice, 10 anexe, 137 pagini de text scris, 79 figuri, 13 tabele. Rezultatele obținute sunt publicate în 7 lucrări științifice.

**Cuvinte-cheie:** educație fizică, randament școlar, inteligență emoțională, perfecționare, mijloace, capacități coordinative, dezvoltare psihomotrică, pregătire motrică.

**Scopul cercetării:** Scopul cercetării constă în perfecţionarea procesului instructiv - educativ la disciplina „educația fizică” a elevilor din treapta primară, prin dezvoltarea capacităților coordinative și sporirea performanței școlare.

**Obiectivele cercetării:**

1. Studierea temei abordate prin sintetizarea datelor din literatura de specialitate privind problematica capacităților motrice și a performanței intelectuale la elevii în vârstă de 9 - 10 ani.
2. Analiza evoluţiei capacităţilor motrice și determinarea etapelor de vârstă favorabile din treapta primară de învățământ, pentru dezvoltarea capacităţilor coordinative.
3. Elaborarea unor structuri de acționare în vederea dezvoltării capacităţilor coordinative şi punerea în evidenţă a realei influenţe a acestora asupra randamentului școlar.
4. Argumentarea experimentală a eficienței proiectării și implementării sistemelor de acționare, cu mijloace specifice pentru dezvoltrea capacităţilor coordinative în cadrul lecţiilor de educaţie fizică cu elevii ciclului primar.

**Noutatea și originalitatea cercetării** constă în elaborarea și implementarea unui program experimental axat pe dezvoltarea capacităților coordinative în lecțiile de educație fizică și influența lor asupra randamentului școlar, al elevilor din treapta primară.

**Problema științifică importantă soluționată.** Analiza situației privind conținutul educației fizice la nivel de învățământ primar din România, a scos în evidență un șir de probleme care țin de nivelul scăzut al pregătirii și dezvoltării fizice a elevilor la vărsta dată. Vorbind despre pregătirea fizică, adică nivelul de dezvoltare a calităților motrice, s – a demonstrat că, capacitățile coordinative, comparativ cu alte calități de bază, sunt dezvoltate la un nivel destul de scăzut, iar dezvoltarea direcționată a acestora ar putea influența pozitiv atât nivelul pregătirii și dezvoltării fizice, cât și performanța școlară în general.

**Semnificația teoretică** a prezentei cercetării, constă în elaborarea unui program de acționare modern și actual la nivelul treptei primare de învățământ, în concordanță cu programa școlară și cu nivelul intelectual al copiilor.

**Valoarea aplicativă** a lucrării constă în posibilitatea cadrelor didactice de specialitate privind aplicarea mijloacelor pentru dezvoltarea direcționată a capacităților coordinative a elevilor ciclului primar în cadrul lecțiilor de educație fizică.

**Implementarea rezultatelor științifice**. Programul de cercetare experimental, a fost aplicat în scopul consolidării unei noi viziuni asupra modalităților de abordare a procesului instructiv-educativ în cadrul orelor de educație fizică cu elevii din treapta primară și a fost implementat în cadrul Școlii Gimnaziale „Mihail Sadoveanu” din Galați, aspect confirmat prin adeverința de implementare.

# АННОТАЦИЯ

Бурлуи Ралука Мэдэлина *„Развитие координационных способностей и их влияние на успеваемость в школе на уровне начального образования”*: кандидатская диссертация по педагогическим наукам. Кишинев, 2023

**Структура диссертации:** введение, 3 главы, выводы и рекомендации, 223 библиографических источника, 10 приложений, 137 страниц письменного текста, 79 рисунков, 13 таблиц. Полученные результаты опубликованы в 7 научных работах.

**Ключевые слова:** физическая культура, школьная успеваемость, эмоциональный интеллект, совершенствование, средства, координационные возможности, психомоторное развитие, двигательная тренировка.

**Цель исследования** : Целью исследования является совершенствование учебно-воспитательного процесса по дисциплине «физическое воспитание» учащихся с начальной ступени, путем развития координационных способностей и повышения успеваемости в школе.

**Задачи исследования:**

1. Изучение рассматриваемой темы путем синтеза данных из специализированной литературы по вопросам двигательных возможностей и интеллектуальной работоспособности у учащихся в возрасте 9-10 лет.

2. Анализ эволюции двигательных возможностей и определение благоприятных возрастных этапов на начальном этапе обучения, для развития координационных способностей.

3. Разработка структур действий с целью развития координационных способностей и выявления их реального влияния на успеваемость в школе.

4. Экспериментальное обоснование эффективности проектирования и внедрения приводных систем с конкретными средствами развития координационных способностей на уроках физической культуры с младшими школьниками.

**Новизна и оригинальность исследования** заключается в разработке и реализации экспериментальной программы, направленной на развитие координационных способностей на уроках физического воспитания и их влияние на школьную успеваемость учащихся с начальной ступени.

**Важная научная проблема решена.** Анализ ситуации, касающейся содержания физического воспитания на уровне начального образования в Румынии, выявил ряд проблем, связанных с низким уровнем подготовки и физического развития учащихся в данном возрасте. Говоря о физической подготовке, то есть уровне развития двигательных качеств, показано, что координационные способности, по сравнению с другими базовыми качествами, развиты на достаточно низком уровне, и их направленное развитие могло положительно влиять как на уровень подготовки и физического развития, так и на успеваемость в школе в целом.

**Теоретическая** значимость настоящего исследования заключается в разработке современной и актуальной программы действий на уровне начальной ступени образования, в соответствии с учебным планом и интеллектуальным уровнем детей.

**Практическая** значимость диссертации заключается в возможности специализированных учителей по применению средств направленного развития координационных способностей младших школьников на уроках физической культуры.

**Внедрение научных результатов**. Экспериментальная исследовательская программа была применена с целью закрепления нового видения путей подхода к учебно-воспитательному процессу на уроках физического воспитания с учащимися начальной ступени и была реализована в средней школе им. Михаила Садовяну в Галаце, что подтверждается сертификатом внедрения.

# ANNOTATION

Burlui Rodica Madalina "**The development of coordinative skills and their influence on the school performance of primary school pupils":** PhD thesis in educational sciences.

Chisinau, 2023

**Thesis structure:** Introduction, 3 chapters, conclusions and recommendations, 223 references, 10 appendices, 137 pages of basic text, 79 figures, 13 tables. The obtained results are published in 7 scientific papers.

**Keywords:** physical education, school performance, emotional intelligence, improvement, means, coordinative skills, psychomotor development, motor training.

**The purpose of the research** consists in improving the instructional - educational process in the "physical education" discipline of primary school pupils, by developing coordination skills and increasing school performance.

**Research objectives:**

1. Analysis of data from specialized literature regarding the issue of motor skills and intellectual performance in pupils aged 9 - 10 years.
2. Observing the evolution of motor capacities and determining the favorable periods for developing coordination skills, taken separately.
3. Elaboration of models in order to apply specific means for developing coordinative skills and highlighting their influence on the school performance of pupils.
4. The theoretical and experimental argumentation of the designing the system of specific means for developing coordinative skills, in the educational approach, within the physical education lessons.

**Scientific novelty and originality** consists in the development and implementation of an experimental program focused on the development of coordinative skills in physical education lessons and their influence on the school performance of primary school pupils.

**Important scientific problem solved.** The analysis of the situation regarding the content of physical education at the level of primary education in Romania, highlighted a series of problems related to the low level of training and physical development of pupils of the given age. Speaking about physical training, i.e. the level of developing motor qualities, it has been demonstrated that, compared to other basic qualities, coordination skills are developed at a rather low level, and their directed development could positively influence both the level of training and physical development, as well as school performance in general.

**Theoretical significance** of the present research consists in the development of a modern and current action program at the primary level of education, in accordance with the school curriculum and the intellectual level of pupils.

**The practical value** of works, consists in the possibility of specialized teaching staff regarding the application of the means for the targeted development of the coordinative skills of primary school pupils during physical education lessons.

**Implementation of scientific results**. The experimental research program was applied to consolidate a new vision on the ways of approaching the instructive-educational process within the physical education classes with the pupils from the primary stage and was implemented within the „Mihail Sadoveanu" Secondary School in Galati, an aspect confirmed by the implementation certificate.

**BURLUI Raluca Madalina**

# THE DEVELOPMENT OF COORDINATIVE SKILLS AND THEIR INFLUENCE ON THE SCHOOL PERFORMANCE OF PRIMARY SCHOOL PUPILS

**Specialty: 533.04. Physical education, sport, kinetotherapy and recreation**

Summary of Doctoral Thesis in Education Sciences


| | |
|---|---|
| Approved for printing: 22.05.2023 | Paper format 60×84 1/16 |
| Paper offset. Offset pattern | Circulation 30 ex. |
| Sheets of print 2,0 | Command 15 |

**State University of Physical Education and Sport**

**MD-2024, Republic of Moldova, Chisinau, 22, A.Doga Street**