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REDEFINING THE PHYSICAL EDUCATION ACTIVITIES BY MEANS OF PSYCHO-PEDAGOGICAL METHODS FOR OPTIMIZING GYMNASIUM STUDENTS' BIOMETRIC DEVELOPMENT

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Abstract: *The purpose of this research is to argue in a scientific manner that the instructional-educational process in physical education lessons brings significant improvements in optimizing the biometric development of high school students. The hypothesis of this study is centred upon the idea that the physical education lesson can be optimized by selecting specific means for physical education, which will determine the developments of the biometric potential for the Gymnasium students. By implementing some elements from the physical education program, the physical condition of the Gymnasium students will be improved, as well as their cognitive and affective capacities. Methods: The research sample consisted of two groups, each with 19 and 16 subjects (35 subjects in total), aged between 15 and 18 years. There have been performed tests validated on a large scale in the field, besides, there have been performed also an observation off the record, in order to analyse, generalize and explain in an empiric way the results. The results: the strategy for the research has included the studying, analysing and the knowledge of the psychological particularities of the subjects' personalities and the way they developed after carrying out the tests. Conclusion: the study brings a contribution to the recognition of the Gymnasium students' biometric potential by making the students be aware of the special effect the physical exercises have, on a daily basis, on their harmonious development, to strengthen their health, in order to prepare them for life and for work.*

Key words: *education, psycho-pedagogy, physical education, psychomotor coordination.*

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1. Introduction

The present study points out the necessity of unitary approach motric-cognitive-social of the activity of physical education for gymnasium education in order to develop in the harmonious way the students, according to the social requirements and the individual ones that involve Redefine PE/HE goals: Place student well-being at the centre, with a wider and long-term perspective [11].

The theoretical premises of the research are represented on the one hand by the nowadays pedagogical theories that promote the learning centred upon the student, the personalized approach of the instructive-educative process, and on the other hand, by the actual theories related to the human development that underline the role of physical development, of the motricity and of biometric parameters for the other dimension of the human development [3], [8].

The experiment that was developed with two groups of students from gymnasium pointed out the fact that, if we have the activity of physical education according to the psycho-motric particularities [10] of the students, in a unitary way, physic-mental-social, we contribute in an important way at the global harmonious development of the students.

The goal of the research consists in studying, analysing and knowing the mental particularities, the personality. The physical development, especially the motric development, by means of the body scheme is important, as it becomes the "material support" of the cognitive and social development, of the individual autonomy. The role of the motricity, of the movement, for the human development has been pointed out by J. Piaget, that affirms that intelligence appears by interacting with the environment [9]. The didactic strategies support the development of mental processes and can be diversified in providing the necessary conditions for the processing of information, some address general learning, the others activate.

2. Brief Literature Review

Physical education is the discipline that forms for the students a conscious attitude about their own body and the exigency of physical and functional self-perfecting, at the same time educating the students multilaterally as well. In the context of the new pedagogical orientation centred on the student, physical education lesson had to include these actual tendencies. The main goal of physical education will be the forming of the motivation concerning the systematic practice of the physical exercises, the development of the motric and functional qualities that influence the student's state of health, which is systematically evaluated [4]. The general objective of the discipline physical education consists in the developing of the bio-psycho-motric aptitudes and forming in students the capacity of controlling them, in order to maintain for themselves a permanent state of well-being, making sure that they develop a harmonious physical development and that they manifest a motric capacity favourable to their professional and social insertion [2]. The importance of the general physical development is underlined also by the fact that a great number of practitioners and theorists in this field affirm that the entire ensemble of the motric actions and the correctness of their practicing consist

physical development is underlined also by the fact that a great number of practitioners and theorists in this field affirm that the entire ensemble of the motric actions and the correctness of their practicing consist mostly in the level of the development of the motric qualities. This point of view highlights the decisive importance the motric qualities have over the majority of students' motric actions they practice during the everyday life or during the school physical education. A compulsory condition of the social progress consists in the necessity of combining in an efficient way of the different aspects of education in any kind of pedagogic approach, based on the general orientation of instruction aiming at a harmonious development, as a fundamental principle. The multilateral instruction in physical education is based on means and methods, specific conditions as well, that determine the physical growth of the individual, together with the spiritual one (the moral, volitional, aesthetical, intellectual one) [6] The implementation of new elements in physical education, without excluding the elements from the physical education program will lead to the improvement of the Gymnasium students' physical condition and their cognitive capacity as well. We consider necessary to diversify the school program by including new means for improving the density of the lesson, the increase of the attractiveness of it and modernizing the physical education lessons in the long run. When we talk about modernizing these lessons we have in mind the didactic process of the lesson that includes methods and methodical procedures that consolidate the development of the instruction process, in order to form and inform the Gymnasium student. During the physical education lessons, one can improve in the best way the quality of the lessons, as well as the biometric development of the students. This makes the role of the physical education and sport grows. The developing of the motric qualities during the gymnasium cycle represents a special importance and interest, taking into account the process of modifying the morphologic and functional accumulation, in relation to these, or under possible over solicitations, due to the caution or overzealousness. At the same time, we have to take into account the priorities and the weights that have to be granted to the different motric qualities or to some forms of manifestation of these in relation to the whole process of the modifications we have already mentioned. The motric qualities are characteristics of the human organism having a native character, whose level of manifestation initially depends on the hereditary genetic found. The harmonious development is very much influenced by the formation of the motric habits and they consolidate together with the evolution of the process of growth and development, being influenced by the specific of the activities, the life conditions, hereditary inheritance, the geographic and climate conditions and the activities that take place in school [7]. All these represent only the possibilities of influencing the development of the motric qualities with different weights and different effects, without having quality assurance, this being the reason why it is necessary that by means of the physical education from school we have to act with specific requirements and constant preoccupations, in order to act in a regular way and in a specialized way for improving the level of the development of these.

After their way of manifestation, we can distinguish four categories: speed, skill, force, resistance, each of them having their own different forms of specific manifestation for their field [2]. The psychomotor behaviour specific for every individual develop depending on his or her aptitude endowment, on his or her degree of physical and intellectual growth and on the educative influences he had. The body scheme is a reference for the movement calibration of the body parts, in a natural way (subconsciously), depending on the axes forward-backward, up-down, left-right [10]. It if from here that we can understand the connection between psychic and motric, that is why the majority of specialists use the term psychomotric development. The social-emotional development is that dimension of the development that refers to the evolution of self-image, self-esteem, moral reasoning, emotions management, interpersonal abilities and establishing social relations so important in the team sport [1].

3. Methodology

The experimental study was carried out in the period September 2020 and June 2024 on a research sample consisted of two groups, each with 19 subjects (experimental group) and 16 subjects (control group) (35 subjects), aged between 15 and 18 years. The students participating in the tests belonged to a high school in Brasov County and were tested during regular physical education classes, in the school schedule.

The experiment in itself did not involve any additional distress to the students, neither additional emotional nor psychological modifications of their status occurred. The participants' caregivers gave their informed consent for the students' participation in the study. The students were informed of the educational purpose of the experiment and about the withdrawing possibility, with no other consequences on their status.

The test of psycho-motric coordination: the subject is blindfolded, with a non-transparent band, at the end of a straight line 7m length, drawn on the ground. The test consists in going through this line and he stops when he assumes that he reached the end of the line. The sign X is marked where the subject stopped. As results from statistical and mathematical calculations, during the research period, motor skills developed upward, which does not justify stating that this age can be acted upon effectively, with specific, carefully selected means for the development of motor skills, without negatively influencing the normal growth rate of students.

The obtained results confirm that the specific methods and systems applied were correctly selected and implemented, leading to the improvement of functional parameters represented in the research through the following four tests: 1. Vital capacity; 2. Matorin Test; 3. Ruffier Test; 4. Psychomotor coordination test.

4. Data Analysis and Interpretation

The presentation, analysis, and synthesis of research data regarding functional parameters and psychomotor coordination are as they follow:

4.1. Vital Capacity

The arithmetic mean of the experimental group at the initial test was

287.11, and at the final test, it was 295.26, resulting in a progress of 8.15 units. The arithmetic mean of the control group at the initial test was 271.25, and at the final test, it was 283.13, with a progress of 11.88 units.

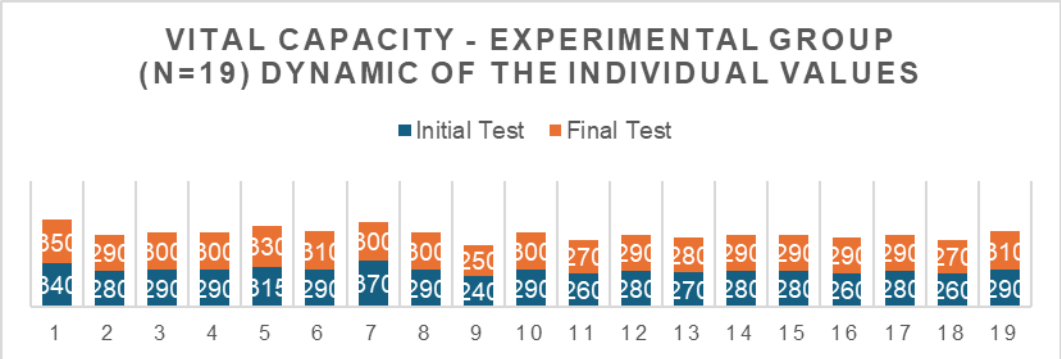

Fig.1. *Dynamics of the values (arithmetic mean) in the functional exploration – Vital Capacity*

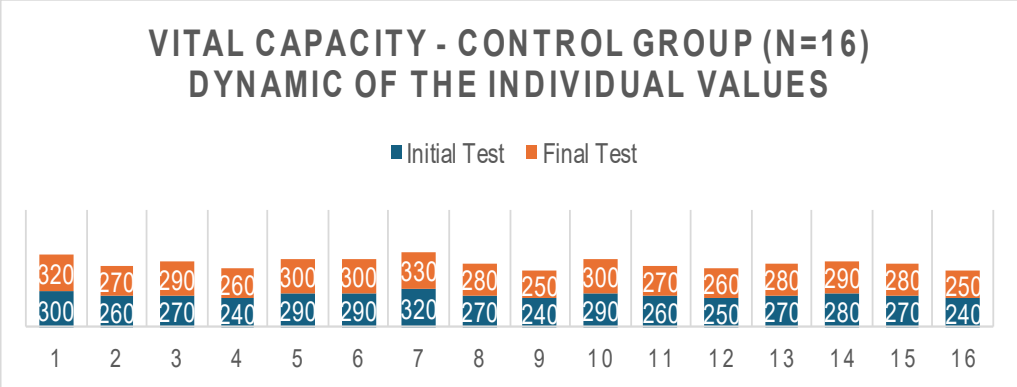

Fig. 2. *Dynamics of the individual values in the functional exploration – Vital Capacity*

4.2. Matorin Test

The results for this test were expressed in degrees.

The arithmetic mean of the experimental group at the initial test was 297.11° and at the final test it was 330.53°, with a progress of 33.42°. The arithmetic mean of the control group at the initial test was 308.75° and at the final test it was 324.38°, with a progress of 15.63°.

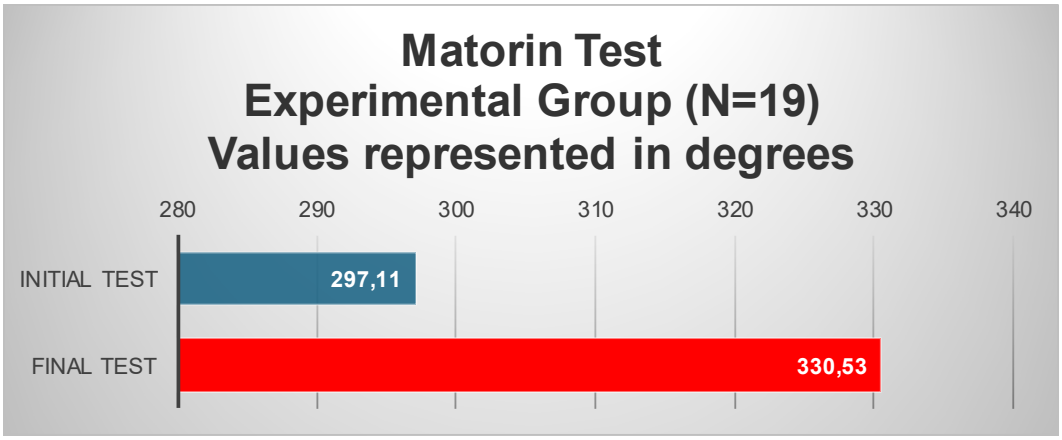

Fig. 3. *Arithmetic Mean of the Experimental Group in the Matorin Test*

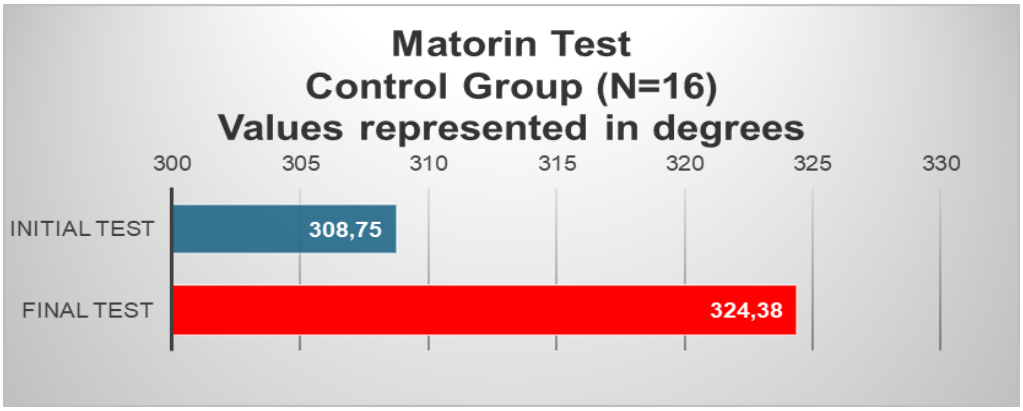

Fig. 4. *Arithmetic Mean of the Control Group in the Matorin Test*

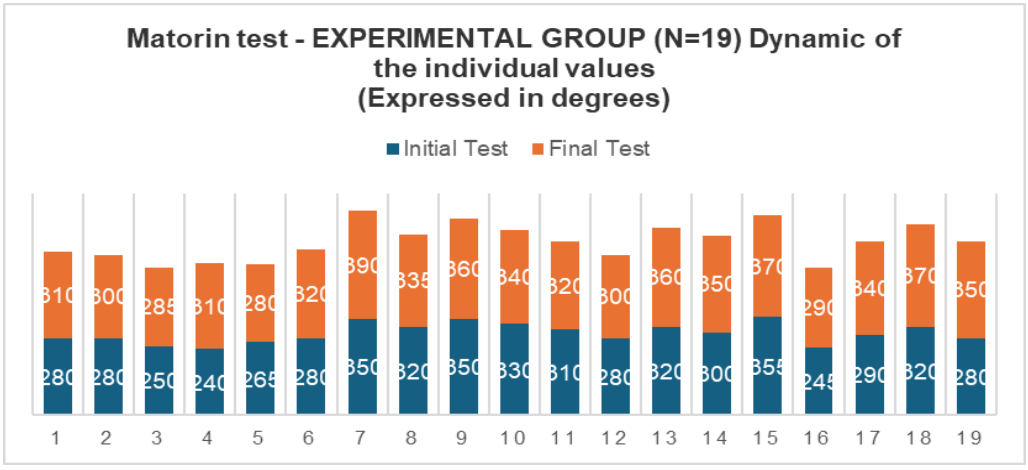

Fig. 5. *Dynamic of the Individual Values in the Matorin Test (Experimental Group)*

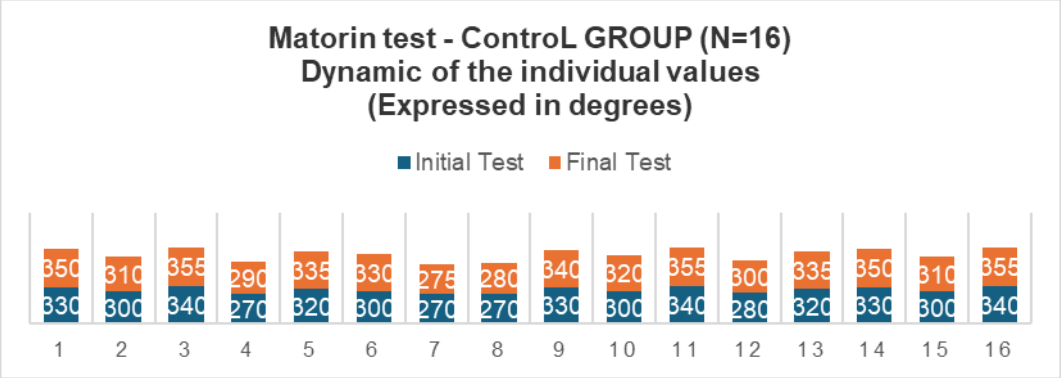

Fig. 6. *Dynamic of the Individual Values in the Matorin Test (Control Group)*

4.3. Ruffier Test

The arithmetic mean of the experimental group at the initial test was 21.32 and at the final test it was 17.89, with a progress of 3.43. The arithmetic mean of the control group at the initial test was 21.13 and at the final test it was 19.00, with a progress of 2.13.

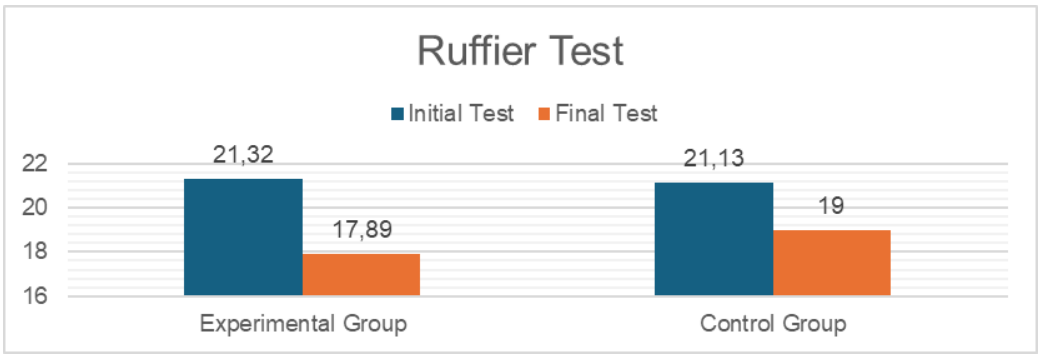

Fig. 7. *Arithmetic mean in the Ruffier Test*

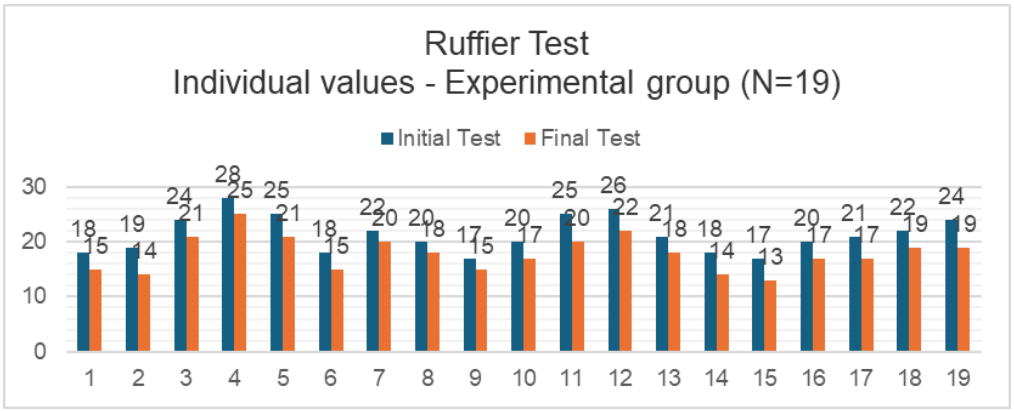

Fig. 8. *Individual Values in the Ruffier Test (Experimental Group)*

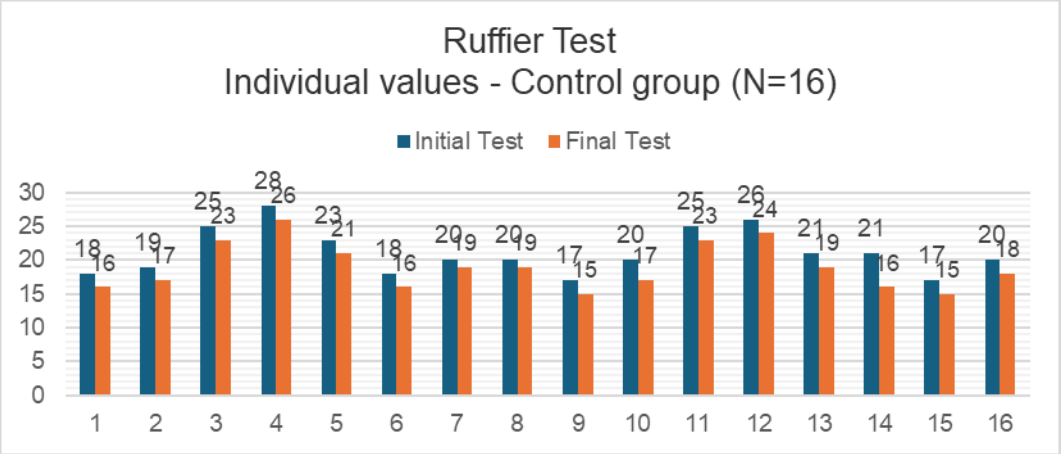

Fig. 9. *Individual Values in the Ruffier Test (Control group)*

4.4. Psychomotor coordination Test

The results for this test were expressed in centimetres. The arithmetic mean of the experimental group at the initial test was 24.21 and at the final test it was 22.05, with a progress of 2.16. The final statistical indicators show better homogeneity in the control group with an amplitude of 11.5 compared to 10.05.

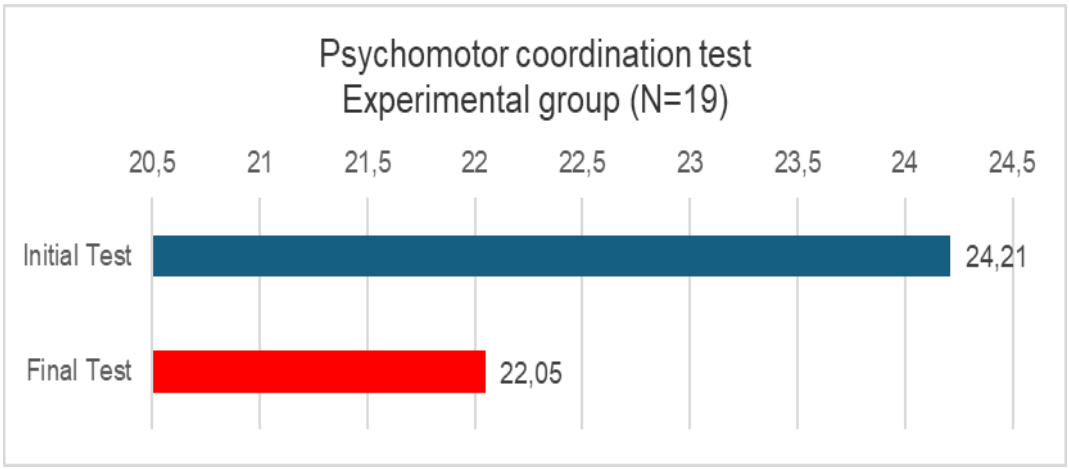

Fig. 10. *Arithmetic mean (experimental group) in the psychomotor coordination test*

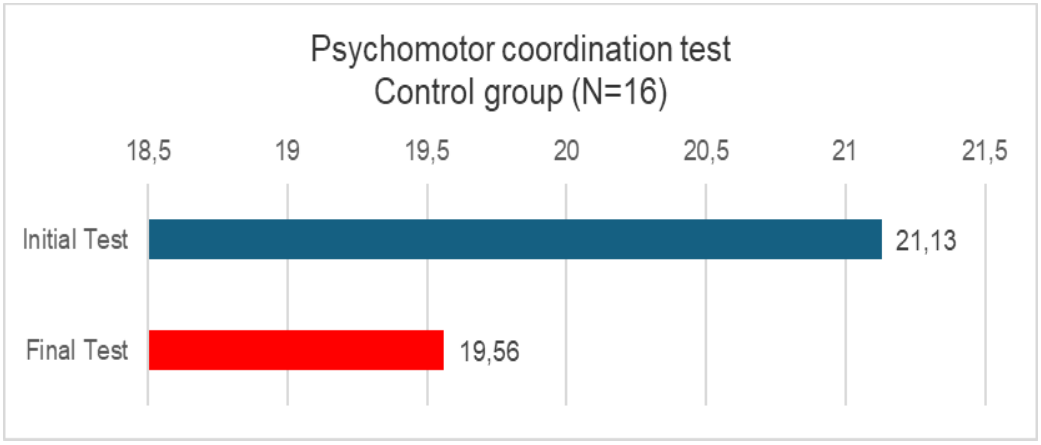

Fig. 11. *Arithmetic mean (control group) in the psychomotor coordination test*

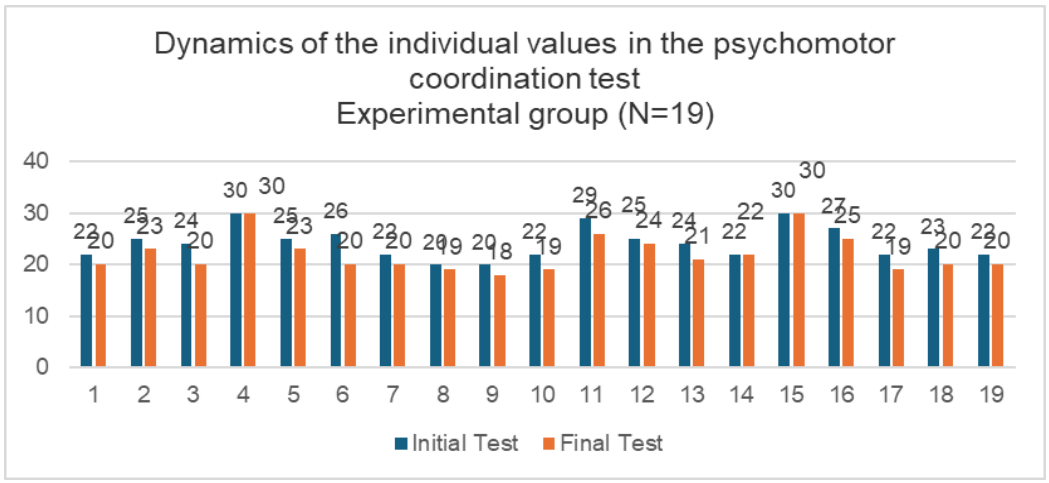

Fig. 12. *Individual values (experimental group) in the psychomotor coordination test*

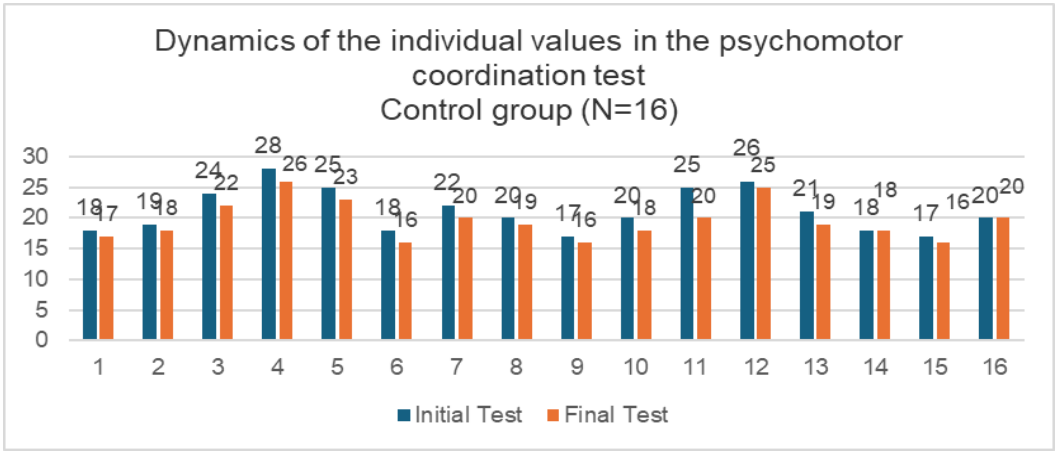

Fig. 13. *Individual values (control group) in the psychomotor coordination test*

5. Conclusions

One of the practical conclusions of the study is that the teaching activity must be designed in a personalized manner, adapted to the specifics of students in the middle and integrated cycle, in a manner that targets motor skills in close connection with cognitive and social ones.

Conscious and active participation, mobilization of forces, demand and responsibility, the ability to overcome difficulties were reflected in the level of preparation and bio motor capacities. A good development of physical education lessons required a bond of relationship and collaboration between the teacher and the students. This was achieved through good communication, through a climate of trust, sincerity and collaboration aimed at mitigating difficulties and dispelling students' doubts.

References

1. Ansari, D., De Smedt, B., Grabner, R.H.: *Neuroeducation – a critical overview of an emerging field*. In: Neuroethics, *5*(2), 2012, p. 105-117. https://doi.org/10.1007/s12152-011-9119-3
2. Balint, L.: *Didactica generală a educaţiei fizice şi a sportului* (*General didactics of Physical Education and Sports).* Braşov, Editura Universităţii Transilvania din Braşov, 2003.
3. Birch, A.: *Developmental Psychology. From infancy to adulthood* (2nd ed.). Macmillan, 1997.
4. Demeter, A.: *Bazele fiziologice și biochimice ale formării deprinderilor motrice* (*Physiological and biochemical fundaments of motor skill formation*). Editura Sport-Turism, 1982.
5. Drewe, S.B.: *The logical connection between moral education and physical education.* In: Journal of Curriculum Studies, 32(4), 2000, p. 561–573. https://doi.org/10.1080/00220270050033628
6. Epuran, M., Tonița, F., Holdevici, I.: *Psihologia sportului de performanță.* (*Psychology of performance sports*). Editura Fest, 2001.
7. Ionescu, M., Preda, V.: *Îndrumător pentru folosirea mijloacelor de instruire* (*Guide to using training aids*). Cluj-Napoca, Universitatea Babeș-Bolyai, 1983.
8. Papalia, D. E., Olds, S. W., Feldman, R. D.: *Human development*. McGraw-Hill, 2007.
9. Piaget, J., Inhelder, B.: *The origin of the idea of chance in children (psychology revivals)*. Psychology Press, 2014.
10. Wauters-Krings, F.: *Psycho (motricité). Soutenir, prévenir et compenser.* De Boeck Education, 2012.
11. OECD: *Making physical education dynamic and inclusive for 2030: International curriculum analysis.* OECD Publishing, 2019. https://doi.org/10.1787/7abe6b02-en