

## Methods and Means for Developing Resistance in the 5th and 6th Grades

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### Abstract

**Introduction:** In all physical education school curricula, starting with the primary cycle and going to high school and vocational school, resistance appears as an educational instructional objective formulated and materialized as a requirement in relation to class, therefore, the age of students (Scarlat E., Scarlat MB, 2002). **Purpose:** is to implement an experiment in the fifth and sixth grades in rural areas, and through the results obtained from this experiment, to be able to find optimal solutions to equip students with a high vital capacity, given that after school most students help their parents with household chores. **Methodology:** Resistance is “the ability of the human body to exert efforts with a relatively long duration and a relatively high intensity, maintaining constant indices of optimal effectiveness”. **Results:** Following the evolution of the arithmetic mean in the endurance running test over the distance of 800m, the boys found that at the initial testing the control group achieved an average of 03:40, and the experiment group achieved an average of 03:29. There is a difference between the control group and the experiment group in favor of the experiment group, namely 11 sec. After the intermediate tests, the control group obtained an average of 03:37, making a progress compared to the initial test by 3 seconds, and the experiment group achieved an average of 03:24. The experiment group made even greater progress than

the control group in the final test, namely 15 sec. Following the evolution of the arithmetic mean in the endurance running test over the distance of 600m girls, we found that in the initial testing the control group achieved an average of 03:08, and the experiment group achieved an average of 03:09. There is a difference between the control group and the experiment group in favor of the experiment group, namely 1 sec. After the intermediate tests, the control group obtained an average of 03:01, making a progress compared to the initial test with 7 sec., And the experiment group achieved an average of 03:04 with 5 sec. better than the initial test. We notice that the experiment group made more progress than the control group in the final test, namely 2 sec. **Conclusion:** this paper emphasizes the importance of the exercises we used and applied to students in the first two grades of high school.

**Keywords:** harmonious physical development, methods, means, systematization, endurance

## **Introduction**

The main means for developing endurance are: running, application courses, sports games, successive repetitions of technical procedures of varying lengths, other specially designed competitions, the main element of progress being the volume of effort (Dragnea A., 2000).

The method of continuous uniform effort is one of the most affordable methods and aims to develop general endurance, in aerobic mode. It is characterized by the uniform intensity of the effort and its duration (Bota A., 2004). The element of progression is the increase in duration, distance or number of repetitions. In this mode of running, the running tempo is very important, which allows the approach of distances (increased progressively) by all students (Petrescu, T., Gheorghe, D., Sabău, E. 2007). In order to respect the established tempo, it is very useful for the teacher to train “leaders” in each class who lead the “platoon” throughout the run, printing a moderate tempo (Colibaba E.D., Bota I., 1993).

Knowing and respecting the particularities of age is a pedagogical necessity, as it conditions the training, determines the selection and use of methods and means of training according to the possi-

bilities and prospects of mental development of children (Dragomir P., Scarlat E. 2004). Practice has eloquently shown that disregarding or ignoring them leads to the failure of teaching and education activities (Horghidan V., 2000, p. 86).

The working hypothesis is the following: using the means proposed by me in this paper, I consider that the resistance will improve significantly, leading to the efficiency of the physical education lesson at the level of the 5th and 6th grades.( Cârstea, 2000)

## **Methods**

The research was conducted on a sample of 40 students, representing the numbers of two grades V and VI. From the 5th grade I chose 20 students, and from the 6th grade I chose a number of 20 students. Out of the total number of students, 10 students represented the control group and 10 students represented the experiment group, both boys and girls.( Dragnea, A. și colaboratorii, 2000)

The training program of the two classes, the experiment class and the control class, included the same number of hours per week, namely 2 hours, according to the structure of the 2020-2021 school year.

The experiment class was used to differentiate according to the content selected and planned through the endurance motor quality, while the control class used the traditional means provided in the units and drive systems for the development of endurance motor quality (Tatu, T., Plocon, E., 2003).

Both in the experimental class and in the control class, the methods and means were used respecting the annual and semester planning, as well as the structure of the physical education lesson, the development of motor quality, endurance, being well defined in this structure (Sabău, E., Monea, G., 2007).

The experiment was planned to take place in three stages, during the school year 2020-2021, as follows:

- the experiment took place between February and June 2021, due to the conditions imposed by the pandemic;

- on February 9, 2021, the initial testing was performed;
- on April 1, 2021, the intermediate testing was performed;
- on June 24, 2021, the final test was performed.

In the elaboration of this paper we used the following methods: documentation, observation, experiment. statistical method.

Documentation is a method that consists in studying auxiliary sciences and specialized materials.

Observation is a method that offers the possibility to consciously and systematically follow the pedagogical process with its different aspects and sides, in order to achieve a previously proposed goal.

Experiment is a basic method in scientific research. We used both the pedagogical experiment, by applying the control tests from the National Assessment System to the discipline of Physical Education and Sports, measured with the help of precision recording devices, stopwatch and roulette, and the laboratory experiment, through which we obtained data on physical development, highlighted by anthropometric measurements (Tudor V., 2001).

Statistical method, collects and sorts the data obtained by accurate measurements. The results and data obtained were capitalized by applying methods of their assessment, by comparison, study, establishing statistics, which allowed the elaboration of research findings. (Barbu, C., Stoica, M, 2000)

Statistical indicators. In interpreting the data obtained from the experiment, we used the following statistical indicators: an arithmetic mean, standard deviation and coefficient of variability.

## **Results**

The experiment took place at the Gymnasium School from Frumușeni, Arad County having as subjects the students of the 5th grade (witness class) and of the 6th grade (experimental class). In order to assess the level of physical development of the subjects included in the research, the variable values of the somatic aspect were recorded: weight and height. In order to assess the students'

motor skills, we used classic tests of the National Assessment and Examination System: endurance running on the distance of 600 m girls and 800 m boys.

These tests were chosen taking into account the requirements of the program, the level of preparation of the classes, the individual characteristics of the students. I also explained to the students the purpose for which they were required to perform the tests, I did demonstrations where necessary and of course I gave them methodical instructions on how to perform.

The test batteries subjected to the experiment in the complete knowledge of the students and in finalizing the conclusions on the level of general physical training were of real use to me. The correct and thorough appreciation of the peculiarities of the students' physical development (age, sex, physical training), as well as of the psychic peculiarities (willpower, character, aptitudes, etc.), is an indispensable condition for the fair use of physical exercises.

### **The means of the experiment**

The means and methods used to develop endurance motor quality are as follows:

#### **Exercise no. 1**

Work formation: in groups, in a row, long running with the change of leader, which remains at the end of the line, 4 minutes girls, 6 minutes boys, repeat 1-2 times, active break 2-3 minutes.

#### **Exercise no. 2**

Work training: students are divided into groups, running time 10 minutes girls, 12 minutes boys in 2/4 tempo, repeat once, active break walk until return.

**Exercise no. 3**

Work group: students are divided into groups, at the sound signal moderate running 300m tempo, 30m accelerated running tempo 4/4, repeat 2-3 times, active break 2-3 minutes.

**Exercise no. 4**

Working group: students divided into groups, at the sound signal, running in various tempo: 50m tempo 2/4, 30m running tempo 3/4, 20m running tempo 4/4, 40m running tempo 2/4, 60m walking, repeat 4-5 times, active break 2-3 minutes.

**Exercise no. 5**

Work group: students are divided into groups, at the sound signal is performed 300m running in tempo 2/4, 300m running in tempo 3/4, 20m running tempo 4/4, 200m walking, repeated 3-4 times, pause active 2-3 minutes.

**Exercise no. 6**

Work group: students are divided into groups, running 300m tempo 2/4, running 300m tempo 3/4, running 200m tempo 4/4, repeated 3-4 times, with active break 2-3 minutes.

**Exercise no. 7**

Work formation: students are divided into groups, at the sound signal, from running with ankle play to accelerated running, repeated 3-4 times, 300m active break 3-4 minutes.

**Table no. 1** - Distribution of exercises during the application of the experiment

The exercise/ Weeks	Distribution of exercises during the application of the experiment													
	February		March			April			May			June		
	1	2	1	2	3	4	1	2	3	4	1	2	3	4
1	X	X					H							
2	X	X	X	X			O							
3			X	X	X	X	L							
4					X	X	I	X	X					
5							D	X	X	X	X			
6							A		X	X	X	X	X	
7							y				X	X	X	X

## **Anthropometric measurements and research evidence**

In order to assess the harmonious physical development, the following anthropometric measurements were performed: the weight measured in “kg” and the waist measured in “m”.

**Weight:** a factor that changes quite quickly, may decrease or increase under the influence of factors such as: diet, exercise, metabolic disorders, etc. A regular medical scale was used, and the children were dressed appropriately.

**Waist:** is the distance between the top of the head (vertex) and the soles and was measured in the position being controlled at the properly marked wall.

## **Description of evidence**

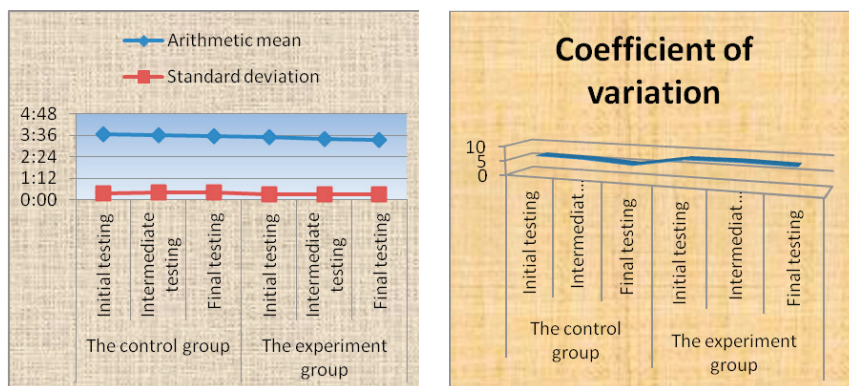
**Test no.1** Consists of endurance running over a distance of **600 m - girls** and **test no. 2** consists of endurance running over a distance of **800 m - boys**. These took place on the sports field. The start was given to the sound of the teacher, the running time being measured in minutes and seconds.



Table no. 2 - Endurance running over the distance of 800m boys

Subjects	The control group			The experiment group		
	Initial testing	Intermediate testing	Final testing	Initial testing	Intermediate testing	Final testing
1	03:10	03:05	03:02	03:26	03:22	03:19
2	03:24	03:22	03:20	03:30	03:25	03:21
3	03:36	03:32	03:30	03:48	03:43	03:39
4	03:58	03:56	03:54	03:16	03:12	03:09
5	03:38	03:36	03:36	03:20	03:18	03:12
6	03:05	03:02	02:58	03:10	03:06	03:02
7	04:00	03:57	03:54	04:07	03:58	03:51
8	03:44	03:40	03:39	03:40	03:34	03:31
9	03:54	03:52	03:50	03:03	02:58	02:55
10	04:12	04:10	04:08	03:32	03:28	03:23
Arithmetic mean	03:40	03:37	03:35	03:29	03:24	03:20
Standard deviation	00:22	00:23	00:23	00:19	00:18	00:17
Coefficient of variation	10,00%	10,60%	10,70%	9,09%	8,82%	8,50%

Graphic representation of the evolution of the results obtained in the 800m run (boys) (in the initial, intermediate and final testing in both the control and the experimental group, analyzing the results obtained in terms of arithmetic mean, variability coefficient and standard deviation.



**Chart no. 1** - Graphic interpretation in the 800m distance endurance running test for boys

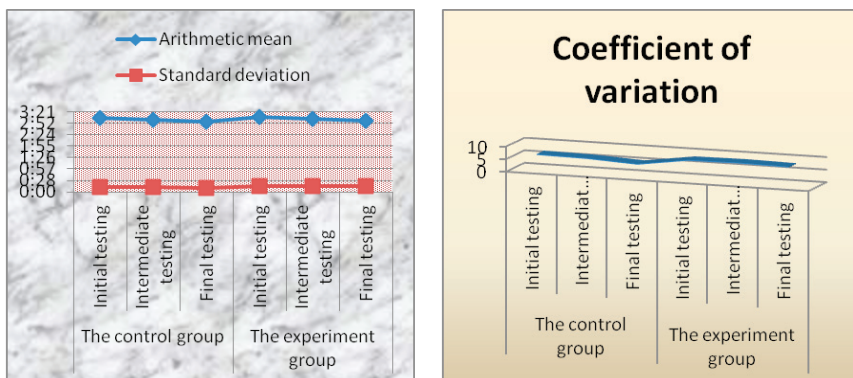
After the initial tests, the control group averaged 03:40, and the experiment group averaged 03:29. There is a difference between the control group and the experiment group in favor of the experiment group, namely 11 sec.

After the intermediate tests, the control group obtained an average of 03:37, making a progress compared to the initial test with 3 sec., and the experiment group achieved an average of 03:24 with 5 sec. better than the initial test. We notice that the experiment group made even more progress than the control group in the final test, namely 15 sec. Following the implementation of special means throughout the experiment we notice a significant progress in the experiment group. The homogeneity of the two groups was good, because the coefficients of variability fall below 15%.

Graphic representation of the evolution of the results obtained in the 600m run (girls) (in the initial, intermediate and final testing in both the control and the experimental group, analyzing the results obtained in terms of arithmetic mean, coefficient of variability and standard deviation.

Table no. 3 - Endurance running over the distance of 600m girls

Subjects	The control group			The experiment group		
	Initial testing	Intermediate testing	Final testing	Initial testing	Intermediate testing	Final testing
1	02:50	02:45	02:50	03:13	03:09	03:04
2	02:58	02:53	02:42	03:27	03:22	03:18
3	03:09	03:01	02:50	02:56	02:53	02:51
4	03:14	02:58	02:56	02:50	02:46	02:40
5	03:02	02:58	02:51	03:03	02:59	02:52
6	03:21	03:15	03:02	03:17	03:12	03:07
7	03:08	03:04	03:00	02:52	02:49	02:44
8	02:53	02:50	02:43	03:36	03:30	03:21
9	03:22	03:15	03:12	03:15	03:10	03:02
10	03:23	03:14	03:09	02:58	02:53	02:47
Arithmetic mean	03:08	03:01	02:57	03:09	03:04	02:59
Standard deviation	00:12	00:11	00:09	00:15	00:15	00:14
Coefficient of variation	-6,38%	6,08%	5,08%	7,94%	8,15%	7,82%



**Chart no. 2** - Graphic interpretation in the 600m distance endurance running test for girls

After the initial tests, the control group averaged 03:08, and the experiment group averaged 03:09. There is a difference between the control group and the experiment group in favor of the experiment group, namely 1 sec.

After the intermediate tests, the control group obtained an average of 03:01, making a progress compared to the initial test with 7 sec., And the experiment group achieved an average of 03:04 with 5 sec. better than the initial test. We notice that the experiment group made more progress than the control group in the final test, namely 2 sec. The homogeneity of the two groups was good, because the coefficients of variability fall below 15%.

The statistical-mathematical calculation methodology allowed me to analyze and compare the results obtained by students in the ascertaining physical tests, in which I calculated: arithmetic mean, standard deviation, confidence interval, maximum value, minimum value, amplitude, dispersion, coefficient of variability and effect size. Graphical representation facilitates understanding of the significance of numerical data.

## Conclusions

Without claiming to replace the traditional means and methods used in the physical education lesson, this paper emphasizes the effectiveness of the exercises we used and applied to students in the first two grades of high school, seen in two ways, instructive and educational, together forming a unitary whole.

The results of the applied experiment confirm the working hypothesis, which contribute to:

- harmonious development of the body and strengthening the health of students;
- development and improvement of all psycho-motor qualities;
- consolidating and practicing basic motor skills and utilitarian-application skills in ever-changing conditions;
- learning and consolidating technical-tactical elements specific to sports: sports games and athletics.

The progress rate of the experimental group, which is higher than that of the control group, confirms the above.

During the experiment it was observed that students manifest spontaneously and can not hide their way of being, the feelings that animate them: joy, satisfaction, anxiety, fear, perseverance, competitiveness and fair play.

The formulation of precise rules and requirements in the tests, led to the discipline of the team, to the development of responsibility towards oneself and towards colleagues, increased the students' self-confidence, taught them to take an attitude towards negative manifestations of conduct, to -develops the competitive spirit and teamwork. Having a common goal, the students got used to work together, to help each other, to encourage each other, qualities that have left their mark on their school activity, on the relations with the family and community members, on the student-teacher relationship.

The difficulties that arose developed in the students self-control, determination, courage, perseverance and perseverance. Stu-

dents who at the beginning of the year were withdrawn, shy, managed to integrate into the team, regain their confidence, became more communicative and more friendly.

Intellectual qualities were also in high demand. Creating problem situations put students in front of solving unique situations, developing their intelligence, inventive, creative spirit, thinking, insight, logic.

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