

THE DEVELOPMENT OF THE GENERAL ENDURANCE OF THE 10TH GRADE STUDENTS IN THE HIGH SCHOOL CYCLE

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Abstract: The purpose of this paper is to study and find the most effective methods and means specific to athletics for developing the general resistance of students in the high school cycle, respectively for the 10th grade. It is assumed that the use of methods and means specific to athletics in the lessons of physical education and sports, to the students of the X class has led to the improvement and development of the motor quality of endurance.

The research was carried out in the municipality of Fălticeni, at the Technical College "MIHAI BĂCESCU", in the students of the 10th grade, in the school year 2008 - 2009. In the paper I included for research a number of 18 subjects, 8 girls and 10 boys. Based on the methods and means used during physical education classes a significant improvement of the effort capacity was observed regarding the development of the general resistance of the students of the X-th class, on which the research was carried out. Thus, the use of methods and means specific to athletics in the physical education and sports lessons, to the students of the X-grade, lead to the improvement and development of the motor quality of endurance.

Introduction: The general resistance gives the individual (student) the opportunity to act efficiently, especially in the duration tests that involve high volume and low or medium intensity. The physical exercises used to develop the general resistance train the whole body, the vast majority of the muscle groups and especially the cardiovascular and respiratory system. The effort is aerobic (without oxygen debt), the body working in relative equilibrium conditions in terms of energy expenditure and oxygen supply. ([4] - I. Savescu, 2007).

The accessibility of the methodological procedures for the development of resistance at the high school level, especially in the 10th grade, must be carefully considered. It is about applying an effort to subjects aged 15-

16 years, an age that implies certain psycho-somatic and functional-morphological changes during this period.

In principle, all procedures are accessible if they are used carefully in terms of effort dosing. Regarding their nature, the exercises used to develop resistance are usually not complicated, which allows the students to practice them. ([2] - Kodzabasisa Igor, 2001).

A very important thing in the school is that of finding the most suitable procedures and means of developing the resistance according to the age of the students, their degree of preparation and the proposed purpose. From a motive point of view, the accessibility of the methodical procedures must be taken into account. Not all students have the same capacity for effort. The difficulty of the effort is in fact the one that determines whether or not the effort will continue. It represents the ratio between the volume of effort and the capacity of the subject. At the moment when the subjects do not have the capacity for effort, the methodical procedure for devoting the resistance in which great effort is applied in relation to their capacity is inaccessible. Obviously, we must not forget the material conditions, which are usually not at a satisfactory level in educational institutions. The time available for the development of resistance must also be taken into account. ([2] - Kodzabasisa Igor, 2001)

The means and methods used in the hours of physical education and sports are of particular importance, constituting one of the most important points before obtaining the desired results. The purpose of the paper is to study and find the most effective methods and means specific to athletics for developing the general resistance of students in the high school cycle, respectively for the 10th grade. The means used in this paper are proving to be effective during the physical education hours at the high school cycle, due to the results obtained from the research.

Material-method: The research was carried out in the municipality of Fălticeni, at the Technical College "MIHAI BĂCESCU", in the students of the 10th grade, in the school year 2008 - 2009. In the paper we included for research a number of 18 subjects, 8 girls and 10 boys. Regarding the summative evaluation, depending on the results of the predictive evaluation performed at the beginning of each cycle of lessons, the teacher will prepare the evaluation scale for each sample to be evaluated. The learning units provided in the National Assessment System for Physical Education will be evaluated, as well as other

learning units considered by the teacher. ([3] - Săvescu, I., 2005). The evaluation of the students in the resistance run will be planned by the teacher and in the 10th grade it will include the running distance of 800 m for girls and 1000 m for boys.

The scale of evaluation of the X-Class resistance run is as follows:

Sexul	The performance achieved according to the notes					
	5	6	7	8	9	10
F	4'35"	4'30"	4'25"	4'20"	4'15"	4'10"
B	4'35"	4'30"	4'25"	4'20"	4'15"	4'10"

In the research I carried out an initial test by which we verified the level of preparation of each student, and a final test by which we verified the way of improving the capacity of effort, regarding the development of the general resistance, by the means and the methods applied during its course.

To perform the experiment or use the following methods:

- **uniform effort method** – when the same intensity is maintained and the volume increases (expressed by duration, distance, number of repetitions, etc.) in the same activity or from one activity to another (lesson, physical activity of maintenance, etc.), ([1] - Gh. Cârstea , 1999). In performing this method I used the following exercises:

- 1) Running in uniform tempo on groups of 8-10 students, on distances of 150-200 m; 2-3 repetitions, active pause 1-2 minutes;

- 2) On groups of 8-10 students, in a row, running on distances of 300-400 m with uniform tempo, 1-2 repetitions, active break 2-3 minutes;

- 3) Running in varied tempo in unordered group over distances of 400-500 m, 2-3 repetitions, active pause 3-4 minutes.

- **the method of repeated efforts** – when the intensity of physical exertion remains constant, but it is performed, with a number of repetitions increasing in the same unit of effort (distance or duration) ([1] -- Gh. Cârstea 1999).

In performing this method I used the following exercises:

1) Students in groups of 8-10 each, execute a run with a semifundal pitch launched in time before established on distances of 200 m, 3-4 repetitions, active break 1-2 minutes;

2) Students in groups of 8-10 each, execute a run with a semifundal pitch launched in time before established on distances of 200 m, 6 repetitions, active break 2-3 minutes;

3) The same exercise but performed on distances of 300 m, 4 repetitions, active break 2-3 minutes.

• **metoda Fartlek** – it is based on the alternation of the different running times, it is also called speed-play; consists in increasing the intensity of the effort, at certain moments of the effort (alternating the uniform running with short portions / durations executed with greater intensity. ([5] - G. Rață, B.C. Rață, 2006)

In performing this method I used the following exercises:

1) Students divided into groups of 8-10, execute at audible signal, moderate tempo run 150m, then 50 m accelerated tempo run 3/4 (intensity 75-80%), 3-4 repetitions, 1-2 active pause ;

2) Students divided into groups of 8-10, perform at sound signal, moderate tempo running 300m, then 150m accelerated tempo running 3/4 (intensity 75-80%), 2-3 repetitions, active break 2-3 minutes;

3) Students divided into groups of 8-10, perform at the beep, run 100 m in tempo 2/4, then 100 m run 3/4 and then 20 m run in tempo 4/4, followed by 100 m walk, 3- 4 repetitions.

Because the exercises for the development of resistance require maximum functions, the cardio-vascular and respiratory system, they are used at the end of the physical education lesson, but before the link "the return of the body after effort". Continuity is a rule of great importance for the development of resistance, and the variation of the volume of effort represents an important element of progress in the development of general resistance. Continuous increase of the duration of the activity or distance - is a decisive element in the development of resistance. Because exercises require maximum functions, it is advisable to use them in any circumstance, in every lesson, even if we have no resistance theme. Exercising and dosing exercises should be done according to the level of preparation and development of the students, the material basis and the objectives proposed in the lesson. ([4] - I. Savescu, 2007).

Results and discussions: In the research I used the following control samples:

- ◆ Resistance run on the distance of 800 m female and 1000 m male: in the resistance tests the trunk is upright (slightly inclined sometimes to the 800 m sample), the shoulders are relaxed, and the arms slightly bent from the elbow joint, move forward / back next to body opposite arm / leg. The position of the trunk, arms and head, which must be in the extension of the trunk, favors breathing. The role of breathing that has to be rhythmic and deep is emphasized, emphasizing the expiration, which will automatically engage the inspiration. In both tests the start is taken from the top, behind a starting line. At the 800 m test, take a straight line, and at the 1000 m turn, take the turn and run the course flat ground. The control tests are carried out on groups of 5-6 students. Walking is prohibited during the test. Time is recorded in minutes and seconds in both female and male.
- ◆ Trunk lifts from the back (abdomen): from the back position with hands on the neck, knees bent at 45 ° and the soles fixed to the ground: trunk lifts at 90 ° and return to the original position. The maximum number of repetitions is recorded in 30 seconds.
- ◆ Squat Thrust sample (from squat with vertical arms with extended arms, followed by squatting and extension in position of floats with support on both palms, also called Korean floats): ([2] - Kodzabasisa Igor, 2001) - from standing on both legs, move in a squat position with your palms on the ground, jump backwards with your legs stretched out and the trunk extension with a squat return, followed by jumping in place on both legs with extension of the arms and trunk and return to the original position. The number of repetitions performed in 45 seconds is recorded.

Based on the norms and control samples, for each sample, we calculated - using the arithmetic mean - the differences between the initial, intermediate and final values, this concretizing the level of progress.

Initial and final testing - control group

The results obtained in the control samples during the initial testing in the control group

Nr. Crt.	INITIAL Name/ First name	Sex	800m (min)		1000 m (min)		Abdomens in 30 "(no./rep.)		Squat Thrust in 45" (nr./rep.)	
			T.I.	T.F.	T.I.	T.F.	T.I.	T.F.	T.I.	T.F.
1.	R. A.	M	-	-	4,21	4,16	25	27	13	15
2.	D. S.	M	-	-	4,29	4,24	27	29	15	17
3.	C. L.	M	-	-	4,20	4,15	26	28	17	19
4.	A. I.	M	-	-	4,25	4,19	26	29	15	18
5.	R. V.	M	-	-	4,18	4,13	23	25	12	16
6.	B. G.	M	-	-	4,30	4,25	25	27	17	19
7.	R. B.	M	-	-	4,07	4,01	26	28	11	14
8.	I. G.	M	-	-	3,57	3,52	26	28	14	18
9.	C. I.	M	-	-	4,00	3,55	25	27	19	22
10.	J. I	M	-	-	4,10	4,04	25	28	11	15
11.	R. C.	F	4,24	4,21	-	-	21	23	9	13
12.	T. V	F	4,32	4,29	-	-	19	21	7	10
13.	M. A.	F	4,26	4,22	-	-	22	24	11	15
14.	N. M.	F	4,16	4,11	-	-	20	23	13	17
15.	P. C.	F	4,27	4,23	-	-	21	23	8	10
16.	T. S	F	4,08	4,05	-	-	23	25	15	18
17.	G. A.	F	4,01	3,56	-	-	20	22	14	17
18.	A. A.	F	4,10	4,04	-	-	22	24	15	18
X			4,18	4,09	4,12	4,02	23,44	25,61	13,11	16,17
S			0,10	0,22	0,20	0,25	2,45	2,50	3,12	2,99
Cv			0,02	0,01	0,05	0,06	0,10	0,10	0,24	0,18

X = Arithmetic mean; S = Standard deviation; Cv = coefficient of variability;

Initial and final testing - experiment group

The results obtained in the control samples during the initial and final testing within the experimental group

Nr. Crt.	INITIAL Name/ First name	Sex	800 m (min)	1000 m (min)	Abdomens in 30 "(no./rep.)	Squat Thrust in 45" (nr./rep.)
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			T.I.	T.F.	T.I.	T.F.	T.I.	T.F.	T.I.	T.F.
1.	C. D.	M	-	-	4,18	4,10	28	30	15	18
2.	P. A.	M	-	-	4,05	3,55	29	31	17	19
3.	R. S.	M	-	-	4,10	3,59	30	32	19	23
4.	G. B.	M	-	-	3,47	3,38	28	30	18	22
5.	T. V.	M	-	-	4,02	3,51	27	29	16	19
6.	S. F.	M	-	-	3,57	3,46	28	30	19	24
7.	L. I.	M	-	-	4,04	3,55	29	32	14	17
8.	N. D.	M	-	-	3,55	3,42	29	32	17	19
9.	Z. C.	M	-	-	4,00	3,50	28	31	20	24
10.	H. B.	M	-	-	3,58	3,49	27	30	15	18
11.	D. E.	F	4,10	4,05	-	-	24	27	13	17
12.	R. M.	F	4,04	3,57	-	-	22	25	10	15
13.	B. R.	F	3,56	3,48	-	-	24	26	15	19
14.	M. A.	F	4,00	3,50	-	-	23	27	17	19
15.	P. I.	F	4,03	3,55	-	-	25	28	10	15
16.	A. O.	F	3,47	3,38	-	-	24	27	18	20
17.	I. S.	F	4,07	4,00	-	-	23	26	17	19
18.	S. M.	F	4,00	3,53	-	-	24	27	18	19
X			3,91	3,63	3,86	3,56	26,22	28,89	16,00	19,22
S			0,23	0,23	0,28	0,20	2,48	2,23	2,77	2,55
Cv			0,06	0,06	0,06	0,07	0,09	0,09	0,17	0,13

X = Arithmetic mean;
S = Standard deviation; Cv = coefficient of variability;

Conclusions:

Based on the methods and means used in the physical education lesson, it was observed that these have made significant improvements among the experiment group. Regarding the development of the motor resistance in the X-grade, we selected

three tests in which all subjects were tested, once at the beginning of the experiment and once at the end, and following the analysis, the following emerged:

Test 1– endurance run for distances of 800 m for women and 1000 m for men.

At the 800 m test, in the initial testing, the control group had an average of 4.18 seconds, and at the final test 4.09 seconds, therefore an improvement of 0.09 seconds was obtained. The experimental group in the initial testing had an average of 3.91 seconds, and in the final testing 3.63 seconds, with an improvement of 0.27 seconds. The difference between the progress of the experimental group and the control group is 0.18 seconds.

In the 1000 m sample, the control group had an average of 4.12 seconds in the initial test and 4.02 seconds in the final one, thus achieving a progress of 0.06 seconds. The experimental group at the initial testing had an average of 3.86 seconds and the final one with 3.56 seconds, with a progress of 0.30 seconds. The progress of the experimental group compared to the control group is 0.24 seconds.

Test 2 – trunk lifts from the back (abdomen) in 30 seconds.

In this sample, in the initial testing, the control group had an average of 23.44 repetitions, and in the final one 25.61 repetitions. The experimental group at the initial testing had an average of 26.22 repetitions, and at the final one 28.89 repetitions. The difference between the initial and final testing of the control group is 2.17 repetitions, and that of the experimental group is 2.67 repetitions. The progress of the experimental group compared to the control group is 2.50 repetitions.

Test 3 - Squat Thrust (from squat vertically with outstretched arms, followed by squat and extension in position of floats with support on both palms).

The subjects in the control group at the initial test obtained an average of 13.11 repetitions, and at the final 16.17 repetitions, achieving a progression of 3.06 repetitions. The experimental group had an average of 16 repetitions at the initial test and the final one with 19.22 repetitions, thus achieving a progression of 3.22 repetitions.

The difference between the progress of the experimental group and the control group is 3.17 repetitions.

Following the experiment, we reached the following conclusions:

- the results obtained from the experiment confirms the working hypothesis of the research.
- using the methods and means specific to athletics in the physical education lesson for the 10th grade students, we have developed the endurance motor skills.
- due to the tests that we carried out during the experiment and the results obtained, a more marked improvement of the experiment group was observed, compared to the control group.
- working with specific means for the development of resistance, at this age, we also developed the motor power "force" that was tested in the control samples that we used: abdomens in 30 seconds and the Squat Thrust sample (from squat vertically with outstretched arms, followed by squatting and extension in position of floats with support on both palms) in 45 seconds, for explosive force development.
- all the tests we chose in the experiment had a very good performance from the students, especially the experiment group.

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[6]

DEZVOLTAREA REZISTENȚEI GENERALE A ELEVILOR DE CLASA a – X –a DIN CICLUL LICEAL

Keywords: calitate motrică, metode, mijloace, rezistență, ciclul liceal

Abstract: Scopul acestei lucrări prezintă studiul și găsirea celor mai eficiente metode și mijloace specifice atletismului pentru dezvoltarea rezistenței generale a elevilor din ciclul liceal, respectiv pentru clasa a X- a. Se presupune că folosirea metodelor și mijloacelor specifice atletismului în lecțiile de educație fizică și sport, la elevii clasei a X- a duc la îmbunătățirea și dezvoltarea calității motrice rezistența. Cercetarea s-a efectuat în municipiul Fălticeni, la Colegiul Tehnic „MIHAI BĂCESCU”, la elevii clasei a X- a, în anul școlar 2008 – 2009.

În lucrare am cuprins pentru cercetare un număr de 18 subiecți, 8 fete și 10 băieți. Pe baza metodelor și mijloacelor folosite în cadrul orelor de educație fizică, s-a observat o îmbunătățire semnificativă a capacității de efort în ceea ce privește dezvoltarea rezistenței generale a elevilor de clasa a-X-a, asupra cărora s-a realizat cercetarea. Astfel, utilizarea metodelor și mijloacelor specifice atletismului în lecțiile de educație fizică și sport, la elevii de clasa a-X-a, duc la îmbunătățirea și dezvoltarea calității motrice rezistența.