

# Study regarding the use of gymnastics - related alternative methods during the physical education class

Talaghir Laurentiu-Gabriel<sup>1, a</sup>, Stoica Leonard<sup>1</sup>, and Ocak Yucel<sup>2</sup>

<sup>1</sup>University Dunarea de Jos, Domneasca Street, no. 46, 800008, Galati, Romania

<sup>2</sup>Afyon Kocatepe University, Erenler Mahallesi, Afyonkarahisar, 03200, Turkiye

**Abstract.** The improvement of motor qualities and skills represents the main concern of the Physical Education lesson. In the present paper we present a general motor exercise training routine, designed as an alternative to the traditional approach of the PE lessons. The routine was divided into three components, namely a cross fit exercise routine, an aerobics routine and an acrosport routine. This routine was implemented in the 5th grade syllabus. The test group was represented by 207 pupils, out of which 114 girls (55.07%) and 93 boys (44.93%). Most participants came from rural areas (66.18%) and 33.82% came from urban areas. The routine was implemented during the first semester of the current school year (2017-2018) in one of the two compulsory lessons. The topics from the traditional PE lesson were replaced by the proposed routines and used alternatively. The assessment consisted of 4 tests from the national assessment system. The results showed significant progress obtained in the final tests for all the 4 trials used ( $p < 0,001$ ).

## 1 Introduction

The Physical Education system from Romania goes through a reformation period from a conceptual and structural point of view. Thus, in the last few years, new curricular documents have been designed for this school subject. These documents intend to offer a modern vision regarding the competences that pupils must acquire. Also, in obtaining these competences, the focus has been laid on the unitary component of the educational process, thus the syllabus was designed on a long-term basis. As a consequence, at present, new curricula for primary school [25, 26] and for secondary school [28] are implemented. These curricula brought about new conceptual elements.

The physical education system in our country relies on the methodology of the lessons organised on 7 moments [12, 20]. This system has responded to educational requirements for a long time. In the last decade, due to technological progress, to social evolution and the emergence of various forms of physical exercise, the lesson organised in the traditional

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<sup>a</sup> Corresponding author: [gtalaghir@ugal.ro](mailto:gtalaghir@ugal.ro)

seven-moment manner seems to no longer meet the demands of the educational teaching process.

Domain-specialists from Romania [4, 21] and from abroad [6, 14, 24] created and proposed different ways of practising physical exercise, which could engage student groups in practical activities. The content of these exercises is oriented towards general physical development, towards the formation and maintenance of an optimal state of health, towards the integration into group activities, towards the pleasure of practising exercise independently as a means of maintaining health [19, 22, 29].

The technical and performance content of the previous school curricula [27] focuses on pupils with special skills for practising sport. This content is not accessible to most students and, as a result, students avoid attending activities they cannot perform, not feeling comfortable and successful. The idea of adapting the content of practical activities from the physical education lesson to social realities is based on European studies on the use of effective ways of exercising [10, 13].

The possibilities to change the way in which practical activities take place led to the idea of implementing changes at the structure level of the lesson as well as at its content level. In the present paper, we intend to present a general motor exercise training routine, designed as an alternative to the traditional approach of the PE lessons. The routine was divided into three components, namely a cross fit exercise routine, an aerobics routine and an acrosport routine

There are many advantages to practising aerobic routines [2, 31]. Their positive influences are emphasized and studied at a global level because they can be varied, used with different age groups, and their use does not imply a previous level of fitness. Also, aerobic exercises are preferred due to their direct influence on the well-being and health of people who practise them [1, 7, 18, 30].

The crossfit exercise routines are used for different age groups, especially for recreational physical activities. Crossfit defines fitness as an increase in working capacity over time and in various fields [11] which, in fact, means the ability to perform varied movements of any kind (cardio, strength, power) for any length of time (short, middle or long duration) [23]. The good effects of these exercises on the health status [9] were not recognized so that they could be transferred to activities in physical education school lessons. Crossfit activities do not require highly developed pieces of equipment and the level of previous physical training should not be high either. These aspects constitute a good premise for the use of this type of exercise in school physical education lessons. Effort intensity adjustment can be achieved by adapting the number and structure of the proposed exercises to the possibilities of the students who practise them as compared to the possibilities of adults [23].

Acrosport is an activity that provides students with a quick motivation and gives pupils the opportunity to be interpreters and choreographers at the same time, thus allowing direct involvement in the activity [15]. This is an alternative to the curriculum when the skills that physical education wants to develop are cooperation, creativity [16], self-confidence [17] and task distribution [5]. The mission of acrosport gymnastics is to provide a safe, and enjoyable educational environment in which participants gain and enhance self-esteem, self-confidence and an "I can" attitude. There are studies that show that the practice of acrosport exercises could improve students' attitude towards physical education, which would contribute to the adoption of a more active lifestyle [3].

The physical requirements that a student must have are agility, mobility, balance, synchronization, harmony and artistic expression. Unlike the other sports disciplines, acrosport does not require any other equipment except for the human body [8].

According to IFSA, the International Federation of Acrobatic Sports, acrosport is defined as an acrobatic sport performed with a partner or as a group, through the creation of

human pyramids, acrobatic jumps and choreographic elements, in which the participant fulfils two clearly-defined functions, portor and agile [16].

The methods used by gymnastics are varied and their direction of manifestation comprises both the motor skills and the specific skills that are trained in students. The use of such a training program (A.C.A. - Training Program) is a prerequisite for a more effective engagement of groups of students in school activities and constitutes an alternative to the content of sports games that prevail in planning documents. The paper represents the equal contribution of all the authors.

## 2 Procedures

As far as the procedure is concerned, the subjects involved in our study were represented by pupils from urban areas (33.82%) and from rural areas (66.18%). The total number of students was 207, out of which 93 boys (44.93%) and 114 girls (55.07%). The research was carried out during the first semester of school year 2017 – 2018. The semester had 17 weeks and 34 practical lessons. The proposed routine was used in one of the two weekly lessons, i.e. it was implemented in 15 lessons. The implementation was made alternatively, namely one cross fit lesson, an aerobics lesson and an acrosport lesson and so on and so forth.

The aerobics routine was performed on a musical background and lasted 20 minutes, being made up of 20 -22 exercises adapted to the pupils' age possibilities. The exercises had simple structures and were performed in a continuous manner so that the pupils move all the time.

For the cross fit exercises, we proposed 6 exercises. They were carried out for 30 seconds with a 30-second break. The exercises were repeated three times. The break was of 1 minute after each exercise. The cross-fit routine lasted 20 minutes. The cross fit exercises were selected in such a way that they influence all muscle groups.

The acrosport exercises were used in view of developing the pupils' teamwork abilities. These structures are not new, but they are totally unused by the domain specialists. The acrosport structures involve the performance and maintenance of a number of acrobatic postures. Thus, they also involve focus, the cooperation with a partner, strength and balance. We proposed acrosport exercises that can be performed in pairs or in groups of three. The acrosport exercises can also be performed in larger groups, but a larger number of participants also involve a high level of motor training. There were three exercises to be performed in pairs, which were repeated for four times, and two exercises to be performed in groups of three, which were repeated for four times. The break after each exercise was of 30 seconds. Thus, the exercises lasted 18 – 20 minutes, depending on the need for further explanations from the part of the teacher.

The assessment process was made by means of 4 tests from the National Assessment System for this age group. The assessment tests were the following: relays 10X5 m., endurance running, throwing the oina ball at a distance and crunches. These trials presuppose the assessment of the basic motor skills.

The tests were carried out according to the following procedure:

The "10x5m relays" test – we drew two parallel lines, at a distance of 5 m from each other; on the lines we place two cones at a distance of 5 m from each other. The student is positioned in front of one of the lines / one of the cones, with one leg touching the line and the other back. At the teacher's signal, he must run as quickly as possible to the other line, touching it with both feet and running back to the start line. One such run is considered a cycle, 5 cycles being needed for this test.

The "long run" test - takes place on a flat ground, individually or in a platoon, each student adopting the personal tempo so as to run continuously, without stopping for four

minutes. We measured and recorded the distance covered by each pupil in the four-minute continuous run.

The “Throwing the oina ball” test – we drew a line on the ground; the pupil who was behind the line threw the oina ball as far as possible. We measured the distance from the line drawn on the ground and the point where the ball first touched the ground.

The “crunches” test – was performed by raising the torso vertically for 30 seconds. We recorded the number of repetitions the pupil managed to perform in the given period of time.

### 3 Results and discussions

The results recorded in the initial and final tests were centralised and statistically interpreted. They are presented in table 1 for the group of boys and in table 2 for the group of girls.

In the case of the group of boys from table 1, we may notice the fact that the results obtained in the final tests were favourable, superior to all the initial tests. This is highlighted by the fact that, for all the tests, the statistical indicator had a highly significant value,  $p < 0.000$ .

**Table 1.** Result of tests – boys’ group

Tests \ Groups	TI(n=93) $\bar{X} \pm m$	TF(n=93) $\bar{X} \pm m$	t	p
The 10x5m (sec) relays	21.93±0.14	20.15±0.08	18.43	.000
The long run 4 min (m.)	566.66±6.34	644.62±5.29	-24.40	.000
Throwing the oina ball (m)	22.04±0.20	24.24±0.14	-16.69	.000
Crunches (30 sec.) (No. of reps)	20.04±0.17	22.30±0.05	-18.47	.000

$p < 0.000$

In the case of the group of girls, too, the value of the significance limit between the results recorded in the final test as compared to the initial test was of  $p < 0.000$ , fact which demonstrates that in the case of the group of girls the tests proposed within the experiment contributed to increasing general motor skills and their manifestation indices.

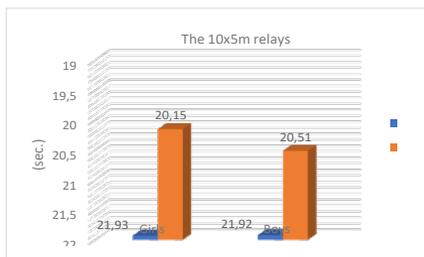
**Table 2.** Result of tests – girls’ group

Tests \ Groups	TI (n=114) $\bar{X} \pm m$	TF (n=114) $\bar{X} \pm m$	t	p
The 10x5 (sec) relays	21.92±0.12	20.51±0.08	19.22	.000
The long run 4 min (m)	499.12±10.64	566.84±9.13	-20.69	.000
Throwing the oina ball (m)	18.09±0.19	20.50±0.18	-29.24	.000
Crunches 30 sec. (No. of reps)	19.35±0.18	21.71±0.18	-21.50	.000

$p < 0.000$

In order to synthetically express the obtained results in the final tests by those involved in the experiment, we represented them graphically.

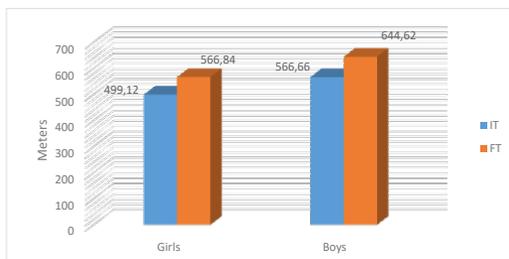
The results of the test are presented in figure 1, in which we may notice that, in the initial test, the groups recorded similar values, the group of girls 21.93 sec and the group of boys, 21.92 sec. These results showed a normal level of growth and development for this age group.



**Fig. 1.** Results of the “10x5 m. relays” test

In the final tests, the results of the group of girls had an average of 20.15 seconds for the group of girls and 20.51 seconds for the group of boys. We could notice that by means of the activities proposed in the experiment, the motor speed significantly improved,  $p < 0.000$ . The girls, who record an advance in mental development as compared to boys at this age, obtained an average performance better than the boys.

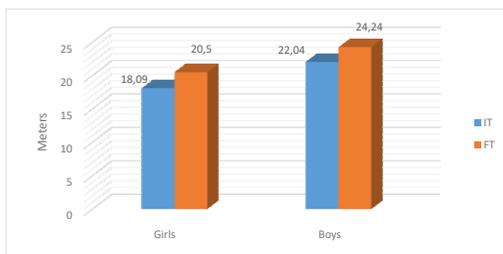
Figure 2 shows the results recorded in the "long run" test. The average values of the initial tests were of 499.12m for the group of girls and 566.6m for the group of boys. Even from the initial test, we noticed a large difference between these results that showed a better effort adaptation of the boys' group.



**Fig. 2.** Results of the “long run” test (m)

The results obtained in the final "long run" test were of 566.84m for the group of girls and of 644.62m for the group of boys. The distance measured during the 4 minutes of running significantly increased so that the progress of the final tests was highly significant,  $p < 0.000$ .

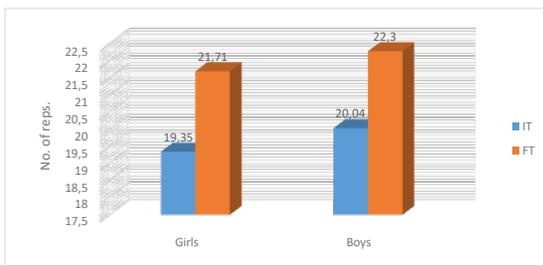
The results obtained in the “Throwing the oina ball” test are highlighted in figure 3. In figure 3 we may notice that, in the initial test, the group of girls recorded an average performance value of 183.09m, whereas the average performance value recorded by the group of boys was of 22.04m. The major difference recorded by the group of boys can be explained by a better throwing technique and not by the level of motor development of the upper limbs.



**Fig. 3.** Results of the “Throwing the oina ball” test (m)

In the final test, the group of girls obtained an average performance value of 20.5 m., significantly better than that recorded in the initial test,  $p < 0.000$ . Also, the result obtained by the group of boys was superior to that obtained in the initial test, recording an average performance value of 24.24 m (fig. 3). In this case, too, the progress achieved was significant,  $p < 0.000$ .

The last test within the assessment system we proposed was “crunches”. In figure 4, we present the results of this test. As we may notice, in the initial test, the group of girls obtained an average performance value of 19.35 repetitions. In the final test, the average performance value for the group of girls was of 21.71 repetitions. This fact indicated significant progress,  $p < 0.000$ .



**Fig. 4.** Results of the “crunches” test 30 sec.

In figure 4, we can also notice that, in the initial test, the average value of the obtained performance by the group of boys was of 20.04 repetitions, whereas, in the final test, the average performance value was of 22.3 repetitions.

We can also assert that the result obtained by the group of boys is a good one and that the recorded progress in this case, too, was a significant one,  $p < 0.000$ .

The good results recorded in all the final tests can be explained by more factors, which directly or indirectly influence the results. These factors are related to the level of growth and development, to the level of participation in the PE class and in these practical activities.

## 4 Conclusions

The conclusion of our study was that PE lessons during which alternative methods are used represent a good and efficient alternative for the practical activities. The accessible exercises engaged all the pupils in the effort. The technical aspects that create discomfort during traditional PE classes were removed.

The use of aerobic exercises led to pupils' involvement in effort for longer periods of time because the exercises proposed were accessible. The musical background probably contributed significantly to increasing the attractiveness of the lessons in which it was used. CrossFit exercises, which use natural movements that are encountered in everyday life, were also well assimilated by the groups of pupils we worked with. Higher levels of intensity made these exercises highly attractive. Even doing the joint tasks led to the possibility of their realization because the students were ambitious to carry out the proposed activities at an upper level, seeing that they had the opportunity to perform such actions.

The acrosport exercises created a high emulation effect among students who were asked to work in groups or teams and to support each other in conducting such actions. Involvement in the activity has led to superior results in the final test.

The results obtained in the final tests showed that the progress recorded by pupils was a significant one for all the trials ( $p < 0,001$ ). We didn't use a specific test in order to measure the development level of the behavioural component.

After the implementation of the "Aerobic CrossFit Acrosport - Training program" at the pilot experimental level, we consider that it can be proposed as an alternative to the physical education lessons in secondary school. We strongly believe that this type of exercise leads to a better involvement of the groups of students in the activity and determines a higher degree of actual participation. The technical-content classes, which also presuppose skills that are not found in pupils' everyday activity, currently, represent a limiting factor in school physical education lessons.

We also believe that this type of exercise routine "A.C.A. - Training program" can represent the content of an optional subject that may exist in the educational offer of schools. Applying it to optional subjects would also contribute to increasing the number of Physical Education classes, which, at the moment, is only maintained at a declarative level in the Romanian education system.

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