

STUDY CONCERNING THE DEVELOPMENT OF MOTOR QUALITIES SPEED AND SKILL AT PRIMARY SCHOOL CHILDREN BY USING MOTION GAMES

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Abstract:

The Physical Education class represents the main form of organising the physical activity within the educational process. During Physical Education classes, we pursue improving students' health, increasing the organism's resistance to environmental factors, developing motor qualities, forming and perfecting motor abilities, initiating students in practising certain sports, developing moral and will qualities. To attain the competences mentioned above, the teacher has to choose, from the multitude of aids and methods teaching Physical Education can use, the ones he or she considers most efficient, also corresponding to the pupils' age and sex particularities to the ones concerning the school's infrastructure and traditions. Considering the fact that organising the educational process must be oriented in a way which allows students to be more than mere executors, making them aware of the value of the actions and exercises they have learnt and of their effects, I noticed that using motion games is particularly effective and has a great influence upon the students, stimulating them to perform the tasks concerning the development of their motor qualities. Thus, the students are given the possibility to benefit from the influence of the game actions, totally mobilising them all along the classes, developing their fair-play spirit and desire for victory.

Introduction

Schiller wrote that human is complete only when they play. Children's and young people's games are carefully studied in specific papers. Jean Chateau considers children's games an intense pleasure, but also a serious activity, in which imitation and involvement of the participants have a tremendous importance [1].

The child sees a game in every activity. “While playing, children reveal themselves in their entire freshness, in their entire spontaneity. While playing, they cannot hide any of the feelings they nature” [10].

There are differences between children’s and adults’ games; thus, adults’ games usually aim at seeking relaxation or leisure time activities, while children’s games aim at affirming the ego.

From the age of seven, the age of schooling, there appear social games. Boys particularly enjoy games linked to victory and performance [2].

The end of childhood means developing games in an organised group, derived from the previous ones. Performance games generate traditional games, competing and cooperating ones, announcing the sports games practised collectively. Imitation games, in their turn, give birth to traditional games, such as different dances and fighting games [8].

The desire for both harmonious physical growth and improving one’s motor abilities influences the development of students’ personality. Motor capacity is defined by Professor I. Săvescu as “the assembly of natural and acquired motor possibilities through which one can make efforts variable from the point of view of structure and dosage” [9].

In early adulthood (18-25 years old), leisure activities have a great importance. The young person admires same-age groups. As players, young people fight for their own prestige and that of the group, they have a good collaboration with their team mates, making use of the skills acquired during the ontogenetic evolution. Trips, which students take part in enthusiastically, also fulfil their desire for adventure. The aspiration for full revelation of personality permeates both the ludic activity, and the leisure one [3].

During the Physical Education classes, Physical Education teachers and primary school teachers pursue the following aims [9]:

- a) Maintaining an optimal health state of those who practise physical exercise systematically, mindfully, and increasing work and life potential;
- b) Favouring growth process and optimising physical development of the organism of those who practise physical exercise systematically and mindfully;
- c) Developing / educating basic motor qualities and those specific to certain sport events or branches;
- d) Properly forming a large system of basic and utilitarian-applicative motor abilities and skills [4];
- e) Forming and perfecting the ability and habit of systematic, proper and mindful practice of physical exercise;
- f) Effectively contributing to the development of intellectual, moral-volitional, esthetical, civic and technical-professional, etc., characteristics and qualities.

While developing our investigation, we hypothesised that, by using motion games during the Physical Education class, we can obtain motivating results and, last but not least, an optimisation of the development of motor qualities of fourth-grade children.

By means of the present paper, I wanted to emphasise the importance of motion games in developing motor qualities, especially speed and skilfulness, in dealing with the topics and aims of the Physical Education classes, and the contribution to their improvement.

Material and Methods

The experimental group is Class 4A, made up of 9 boys and 8 girls, the witness group is Class 4B, made up of 10 boys and 5 girls, students at Middle School No. 2 in Vicovu de Jos.

The investigation lasted 7 months, between October 1, 2017 and May 1, 2018 for both classes. The Physical Education class was held according to each class' timetable, that is two classes per week, and consisted in watching the investigated subjects and recording the results of the initial and final evaluations. The initial evaluation of the subjects, both in the experimental and the witness group, was performed during the first part of the first term of the school year 2017-2018, at the beginning of October, and the final evaluation in May the same year, then we compared the results.

Within each lesson with the experimental group, we used dynamic games, applicative trails and relay races during different moments of the lessons, pursuing different goals. The experiment was conceived with the purpose of proving the contribution of applicative trails to the development of the morpho-functional indices within primary grades.

While teaching and applying the trails, I observed the rules of the Accessibility Principle: from easy to hard, from simple to complex, from known to unknown. Beside the bio-motor influence of games, relays and applicative trails, I also observed the educational and psychical influences. As we have shown, with the experimental group we used dynamic games, relays, but also other means and methods specific to teaching Physical Education.

Tests and evaluation events:

- anthropometric measurements: height, weight, heart and breath rate;
- capacity measurements:

1. Evaluated capacity: motor quality speed;

Evaluation instruments: 25 m speed running; 5x5m commuting.

2. Evaluated capacity: motor quality skilfulness

Evaluation instruments: alternative shift rope skipping; vertical targeting.

Results

The tests applied, as well as the interpretation of the resulting parameters, offer the possibility to appreciate the efficiency of the applicative trails and relays, of the morpho-functional indices, and of the motor qualities of the investigated subjects.

Regarding somato-functional indices, in the process of growth and ensuring the harmonious physical development of the children, waist circumference has a central place as a standard measurement, to which we add the other harmony indices. It is particularly influenced by hereditary factors, and less by the motor ones. We applied two evaluations within the investigated classes, one initial and one final. Weight is greatly influenced by lifestyle. Its variations are large, as it increases and decreases easily.

Table 1. Somato-functional indices class 4b, witness group

| Indices | Height (m) | | | Weight (kg) | | |
|--------------|-----------------|---------------|----------|-----------------|---------------|----------|
| | Initial Testing | Final Testing | Progress | Initial Testing | Final Testing | Progress |
| A. Average | 1.39 | 1.41 | 0.02 | 30.92 | 31.80 | 0.88 |
| S. Deviation | 0.07 | 0.07 | 0.10 | 3.69 | 3.94 | 1.45 |
| Max. value | 1.55 | 1.57 | 0.03 | 39 | 41 | 2 |
| Min. value | 1.22 | 1.24 | 0.02 | 22 | 23 | 1 |

As we can notice in table no. 1, height medium value is 1.39 m in the initial testing and 1.41 m in final testing, so we have got a medium growth of 2 cm. The extreme values are situated between 1.22 and 1.55 m in the initial testing, and between 1.24 and 1.57 in the final testing.

In table no. 1 as well, weight medium value is 30.92 kg in the initial testing and 31.80 kg in the final testing, so we have got a medium growth of 0.88 kg. The extreme values are situated between 22 and 39 kg in the initial testing, and between 23 and 41 kg in the final testing.

Table 2. Somato-functional indices class 4b, experimental group

| Indices | Height (m) | | | Weight (kg) | | |
|--------------|-----------------|---------------|----------|-----------------|---------------|----------|
| | Initial Testing | Final Testing | Progress | Initial Testing | Final Testing | Progress |
| A. Average | 1.41 | 1.45 | 0.04 | 34.42 | 38.07 | 3.65 |
| S. Deviation | 0.08 | 0.08 | 0.11 | 8.26 | 8.33 | 1.77 |
| Max. value | 1.52 | 1.56 | 0.04 | 51 | 54 | 3 |

| | | | | | | |
|------------|------|------|------|----|----|---|
| Min. value | 1.26 | 1.30 | 0.04 | 24 | 27 | 3 |
|------------|------|------|------|----|----|---|

In table no. 2, height medium value is 1.41 m in the initial testing and 1.45 m in final testing, so we have got a medium growth of 4 cm. The extreme values are situated between 1.26 and 1.52 m in the initial testing, and between 1.30 and 1.56 in the final testing.

In table no. 2 as well, weight medium value is 34.42 kg in the initial testing and of 38.07 kg in the final testing, so we have got a medium growth of 3.65 kg. The extreme values are situated between 24 and 51 kg in the initial testing, and between 27 and 54 kg in the final testing.

We can notice that, between the initial and the final testing, we have recorded growth regarding both the height and the weight.

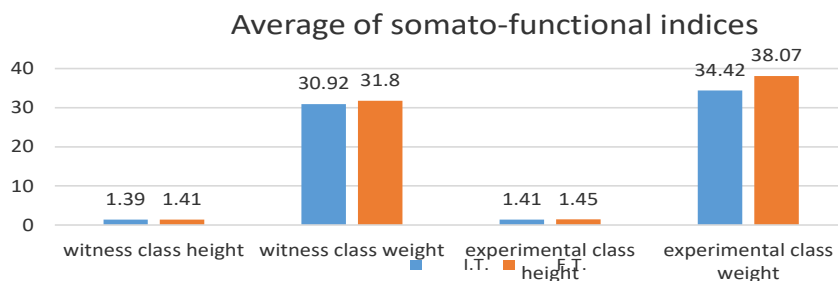


Fig. 1. Average of somato-functional indices

Table 3. Somato-functional indices class 4b, witness group

| Indices | Heart Rate | | Breath Rate | | Chest Perimeter (cm) | | | | | |
|---------------|-----------------|---------------|-----------------|---------------|----------------------|------|------|------|------|------|
| | Initial Testing | Final testing | Initial Testing | Final testing | I. T. | | | F.T. | | |
| | | | | | R.S. | F.I. | F.E. | R.S. | F.I. | F.E. |
| Average | 95.46 | 104.26 | 22.5 | 24.19 | 62.3 | 64.9 | 60.8 | 63.6 | 66.1 | 62.1 |
| St. Deviation | 10.75 | 9.24 | 3.69 | 3.94 | 9 | 9.02 | 8.98 | 9.45 | 9.22 | 9.56 |
| Max. value | 122 | 124 | 25 | 28 | 96 | 99 | 95 | 100 | 102 | 99 |
| Min. value | 80 | 92 | 19 | 23 | 53 | 57 | 50 | 54 | 57 | 51 |

In table no. 3, we measured the heart rate within the witness class, which was 95.46 at the initial testing and 104.26 at the final one, the breath rate being of 22.5 at the initial testing and 25.19 at the final one.

The chest perimeter at the initial testing was 62.3 cm while in resting state, 64.9 cm while forcibly inhaling and 60.8 cm while forcibly exhaling; whereas at the final testing it was 63.6 in resting state, 66.1 while forcibly inhaling and 62.1

Table 4. Somato-functional indices class 4b, experimental group

| Indices | Heart Rate | | Breath Rate | | Chest Perimeter (cm) | | | | | |
|------------|-----------------|---------------|-----------------|---------------|----------------------|-------|-------|-------|-------|-------|
| | Initial Testing | Final testing | Initial Testing | Final testing | I. T. | | | F.T. | | |
| | | | | | R.S. | F.I. | F.E. | R.S. | F.I. | F.E. |
| Average | 97.73 | 102.30 | 23.35 | 23.03 | 66.99 | 70.06 | 66.03 | 70.03 | 74.03 | 68.23 |
| St. dev. | 10.75 | 9.24 | 3.69 | 3.94 | 9 | 10.02 | 9.98 | 10.95 | 10.27 | 10.86 |
| Max. value | 125 | 125 | 39 | 41 | 89 | 91 | 87 | 94 | 97 | 92 |
| Min. value | 90 | 90 | 22 | 23 | 62 | 61 | 60 | 62 | 66 | 61 |

In Summary Table No. 4, we measured the heart rate within the experimental class, which was 97.73 at the initial testing and in the final one 102.30 in the final one, the breath rate being of 23.35 at the initial testing and 26.20 at the final one.

The chest perimeter at the initial testing was 66.99 cm while in resting state, 70.06 cm while forcibly inhaling and 66.03 cm while forcibly exhaling; whereas at the final testing it was 70.3 in resting state, 74.03 while forcibly inhaling and 68.23 while forcibly exhaling.

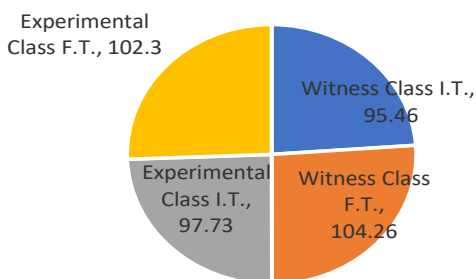


Fig. 2. Heart Rate values

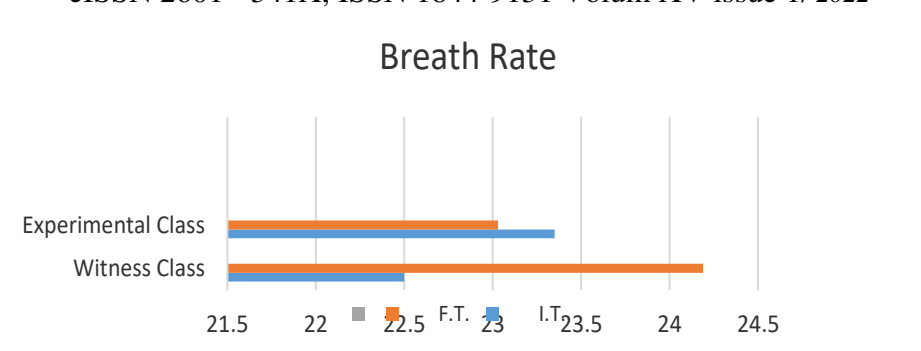


Fig. 3. Breath Rate values

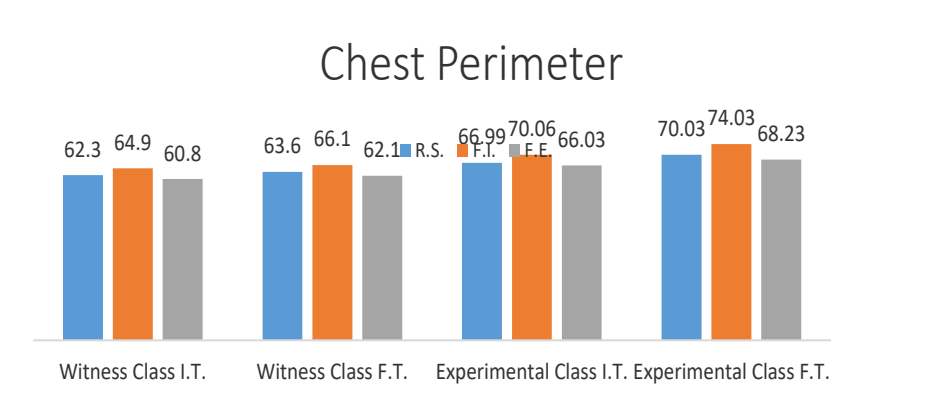


Fig. 4. Chest Perimeter

Table no. 5 Motor skills level class 4b, witness group - speed

| Indices | Speed Running 25m | | | Shuttle run 5x5 m | | |
|------------|-------------------|------|------|-------------------|------|------|
| | I.T. | F.T. | P. | I.T. | F.T. | P. |
| A. Average | 5.09 | 5.01 | 0.08 | 8.91 | 8.80 | 0.11 |
| Max. Value | 5.56 | 5.50 | 0.06 | 9.72 | 9.70 | 0.02 |
| Min. Value | 4.57 | 4.47 | 0.10 | 8.22 | 8.13 | 0.09 |

In table no. 5, illustrating speed running results for the witness class, the medium value is 5.09 seconds at the initial testing and 5.01 seconds at the final testing, so there is a medium growth of 0.08 seconds. The extreme values are situated between 5.56 and 4.57 seconds in the initial testing and between 5.5 and 4.47 seconds in the final testing.

Also, the shuttle run 5x5 m with the witness class, the medium value is 8.93 seconds at the initial testing and 8.83 seconds in the final one, so we have a medium time improvement of 0.10 seconds. The extreme values are situated

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 between 9.72 and 8.22 seconds in the initial testing and between 9.60 and 8.13
 seconds in the final one.

We notice that at both events there were improvements of the results in the
 final testing face to the initial one.

Table 6. Motor skills level class 4A, experimental group - speed

| Indices | Speed Running 25m | | | Shuttle run 5x5 m | | |
|------------|-------------------|------|------|-------------------|------|------|
| | I.T. | F.T. | P. | I.T. | F.T. | P. |
| A. Average | 4.89 | 4.58 | 0.31 | 8.94 | 8.54 | 0.40 |
| Max. Value | 5.40 | 5.18 | 0.22 | 9.72 | 9.35 | 0.37 |
| Min. Value | 4.34 | 4.07 | 0.27 | 8.22 | 7.57 | 0.62 |

In table no. 6, illustrating speed running results for the experimental class,
 the medium value is 4.89 seconds at the initial testing and 4.58 seconds at the final
 testing, so there is a medium growth of 0.31 seconds. The extreme values are
 situated between 5.40 and 4.34 seconds in the initial testing and between 5.18 and
 4.07 seconds in the final testing.

Also, at shuttle run 5x5 m with the experimental class, the medium value is
 8.94 seconds at the initial testing and 8.54 seconds in the final one, so we have a
 medium time improvement of 0.40 seconds. The extreme values are situated
 between 9.72 and 8.22 seconds in the initial testing and between 9.35 and 7.57
 seconds in the final one.

We notice that at both events there were improvements of the results in the
 final testing face to the initial one.

Table 7. Motor skills level class 4B, witness group - skills

| Indices | Alternative Shift Rope Skipping | | | 7m Ball Targeting | | |
|------------|---------------------------------|-------|-------|-------------------|------------|--------|
| | I.T. | F.T. | P. | I.T. | F.T. | P. |
| A. Average | 7m | 8.57m | 1.57m | 1.85 m | 2.57 m | 0.72 m |
| Max. Value | 11m | 11m | 0 | 3 out of 4 | 4 out of 4 | 1 |
| Min. Value | 3m | 3m | 0 | 0 out of 4 | 1 out of 4 | 1 |

In table no. 7, concerning the witness class, the alternative shift rope
 skipping event, the medium value is of 7 m in the initial testing and of 8.57 m in
 the final one, so there is a medium growth of 1.57 m. The extreme values are
 situated between 11 and 3 m in the initial testing and between 11 and 3 m in the
 final testing.

Regarding the 7 m ball targeting event, the medium value is of 1.85 m in
 the initial testing and of 2.57 m in the final one, so there is a medium growth of
 0.72 m. The extreme values are 0 throws out of 4 and 3 throws out of 4 in the initial

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 testing and 1 out of 4 and 4 throws out of 4 in the final one.

We notice that at both events there were improvements of the results in the final testing compared to the initial one.

Table no. 8 Motor skills level class 4A, experimental group - skills

| Indices | Alternative Shift Rope Skipping | | | 7m Ball Targeting | | |
|------------|---------------------------------|---------|--------|-------------------|------------|--------|
| | I.T. | F.T. | P. | I.T. | F.T. | P. |
| A. Average | 8.12 m | 12.31 m | 4.19 m | 1.62 m | 3.12 m | 1.50 m |
| Max. Value | 11 m | 20 m | 9 m | 3 out of 4 | 4 out of 4 | 1 |
| Min. Value | 5 m | 9 m | 4 m | 0 out of 4 | 2 out of 4 | 2 |

In table no. 8, concerning the experimental class, the alternative shift rope skipping event, the medium value is of 8.12 m in the initial testing and of 12.31 m in the final one, so there is a medium growth of 4.19 m. The extreme values are situated between 11 and 5 m in the initial testing and between 20 and 9 m in the final testing. Regarding the 7 m ball targetting event, the medium value is of 1.62 m in the initial testing and of 3.12 m in the final one, so there is a medium growth of 1.50 m. The extreme values are 3 throws out of 4 and 0 throws out of 4 in the initial testing and 2 out of 4 and 4 throws out of 4 in the final one.

We notice that at both events there were improvements of the results in the final testing compared to the initial one.

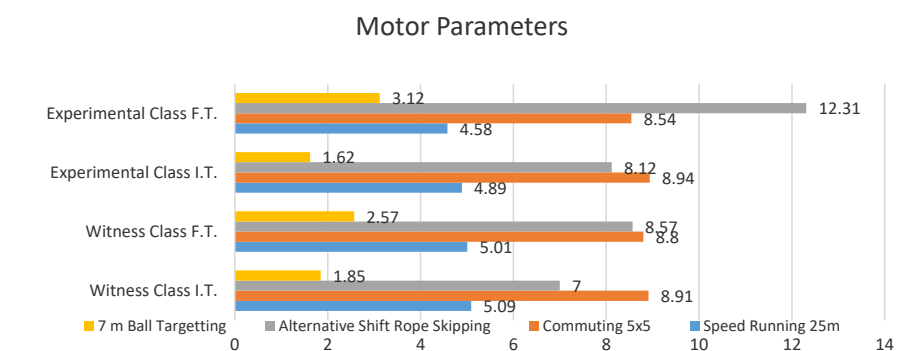


Fig. 5. Motor skills Parameters

Conclusion

Developing morpho-functional indices with students is one of the tasks of Physical Education. The content of the present paper is specifically concerned with this very aspect.

Spatial orientation, air, capacity to adapt to various conditions and situations, execution speed, and also elegance of movements are characteristic to applicative trails. The essential element in most cases is running, a natural applicative motor ability, in absence of which we can hardly conceive of a trail, adding to these relays as a catalyst of physical effort [5].

Subsequent to the experiment we conducted, we can draw the following conclusions:

- the applicative trail contributes to the increase of the degree of effectiveness of the Physical Education class, when it is used together with other means;
- it can be used during stages 1,3,7, and 8;
- trails must be chosen according to children’s age and sex particularities, level of training and existing infrastructure;
- the group must be divided into sub-groups, equal as value;
- trails must answer the aims of the lessons;
- they must observe the learning principles, that is from easy to hard, from simple to complex, from known to unknown;
- the range of trails and relays must be various, with a new trail during every lesson, to prevent the appearance of boredom and lack of interest;
- using trails in class determined an active and very effective participation of the students;
- trails and relays lead to collaboration and cooperation between students.

Through content, form and effects, trails have a lot of advantages, compared to other resources specific to Physical Education, offering conditions favourable to the simultaneous development of the morpho-functional indices, of the motor qualities, as well as of the psychical processes and of the personality [6,7,11].

Perfecting motor capacity and improving morpho-functional indices are correlated with influencing personality development and its integrity

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