

**ABSTRACT OF THE DOCTORAL THESIS**

**OPTIMISING PRIMARY SCHOOL STUDENTS' SPEED CAPACITY  
WITH ALTERNATIVE MEANS IN PHYSICAL EDUCATION CLASSES**

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Part I: **THEORETICAL AND METHODOLOGICAL ASPECTS CONCERNING THE EDUCATION OF SPEED IN PRIMARY SCHOOL STUDENTS**, includes seven chapters: **Chapter 1**: Introduction to the issues of the issues; **Chapter 2**: The Educational System and guiding documents to teach physical education in schools; **Chapter 3**: Forms of organising physical education; **Chapter 4**: Speed – Psychomotor skill; **Chapter 5**: Particular traits of primary school students' development; **Chapter 6**: Roller skating –alternative sport; **Chapter 7**: Theoretical conclusions and suggestions.

**MOTIVATION OF THE CHOICE OF THE THEME**

The modifications occurred over the last years at the level of the primary school curriculum for physical education have tried to solve the lack of consistency between students' interests and the educational offer of the subjects in the educational framework.

Over the years, the physical education curriculum has become more flexible, offering the possibility to acquire the core contents as well as the alternative ones, upon the teachers and students' decision. Taking into account that primary school students tend to take pleasure in engaging in activities such as roller skating, ice skating, rugby-tag, tri-cycling, we think it appropriate to introduce such activities in the physical education class. The current curriculum allows for the choice of contents, activities so that they could be regarding by the students as relaxing, fun, which satisfy their interests, inclinations, and skills.

Roller skating belongs to the group specific to alternative/seasonal sports along with skiing, swimming, chess, rugby, and sledding. Although it is highly suitable to primary school students' interests and pleasures, the technical elements and procedures specific to roller skating, which are to be acquired, are not described in the physical education curriculum unlike other sports such as athletics or games such as volleyball, handball, and basketball. Moreover, there is no specialised (physical education) literature that would contain technical description or teaching methodology in school for roller skating.

Practised as a recreational activity, roller skating is acquired chaotically ever since the first years in life as it is done by imitation of other children or urged by parents which do no master specialised terminology, favouring thus the acquisition of

wring motor skills. The lack of a school curriculum for roller skating, which would include learning contents and their technical description, has generated the acquisition of motor skills that do not ensure avoidance of accidents and students' protection during roller skating competitions included in the National Olympiad of School Sports for primary school.

This thesis is a didactic point of view which proposes a new approach of teaching, learning, primary school students' evaluation in physical education and sport by promoting a school curriculum for roller skating.

The school curriculum for roller skating we have compiled is in line with, the trends in physical education, realising an appropriate balance between the intellectual and physical effort, by means of specific organised drills with a view to enhancing children's normal development. The introduction of roller skating in the organised framework of physical education classes has as an effect the removal of boredom and the approach of activity as a play adapted to the children's age specificity.

As the school curriculum is overloaded with drills specific to athletics, which repeated generate monotony, a didactic approach that would include creative means to stimulate children's interest through movement and would develop children's motor capacity is regarded as a priority.

The technical elements and procedures of roller skating represent a novelty that could also stand for a solution to elimination the large number of students exempt from physical education on medical grounds. The school curriculum includes general and specific competence, examples of learning activities, and an evaluation system, which represents tests as per the minimum standards for a "fair" grade in primary school, i.e., 1<sup>st</sup> to 4<sup>th</sup> grade. Even if in the preparatory grade grading is not allowed, still there are minimum standards stated for this level as well with a view to completing the evaluation report that would demonstrate the students' acquisitions during a school year. Moreover, the school curriculum includes an individual chart for the evaluation of the level of execution of the elements and techniques specific to roller skating which represent the performance descriptors for the grades "very well", "well, and "fair."

The opportunity of practising roller skating in the physical education classes based on a school curriculum ensures both the modernisation of the process of creating alternative means to develop motor skills and their making more efficient.

### ***Scope and objectives of the research***

The curriculum was devised in order to ensure the accurate acquisition of roller skating by primary school students, with a view to optimising their speed-related indices.

The general objectives proposed to be met are:

- to study of specialised literature;
- to know the opinion of physical education and sport teachers in the Neamt county with respect to approaching alternative sports in the physical education class;
- to know the level of development of primary school children;

- to know the level of development of speed by using roller skating in the physical education class;
- to draft a curriculum for roller skating.

### ***Theoretical conclusions and suggestions***

Starting from the main reason of the research, namely that the modernisation of teaching represents the cause imposed by the current trends that determine the use of new teaching methods and means adapted to the children's individual specific particular traits, after having studied the specialised literature, we have reached the following conclusions:

- the teaching – education process is structured and organised by observing the specificity of children and youth's development;
- the educational framework plan allows for the education of children according to their options and those of their parents;
- the school curriculum allows for the progressive development of skills specific to physical education according to the students' motor and psychological specificity;
- the development of motor capacity at the 6 to 11-year-old age groups favour the education of speed and coordinating skills, and the acquisition of motor skills is carried out by imitation and systematic repetitions;
- alternative/seasonal sports can be practised both in core curriculum classes and in optional ones and they impose by the novelty and diversity of the learning contents;
- there are no specialised works that would present the technical and methodological aspects of alternative sports (roller skating), not are there any appropriate and sufficient material facilities.

The analysis of this theoretical part has led us to consider necessary:

- the development of a study concerning the approach of alternative sports in the schools in the county of Neamţ;
- the development of a study concerning the level of speed development in primary school children and the modification of the national evaluation system for primary school by adding new evaluation tests at children and teachers' choice;
- the development of study concerning the dynamics of speed development in primary school children as a result of the promotion of roller skating specific means in the physical education class.

**Part II: PRELIMINARY RESEARCH CONCERNING THE APPROACH OF ALTERNATIVE SPORTS AND KNOWLEDGE OF THE SPEED LEVEL IN PRIMARY SCHOOLS** includes three chapters: **Chapter 8:** The research operational approach; **Chapter 9:** Study concerning the teachers' opinions on using alternative/seasonal sports in primary school; **Chapter 10:** Study concerning the level of manifestation of speed in primary school children.

## ***Purpose of the Preliminary Research***

This research aims at knowing the teachers' opinions with respect to practising alternative/seasonal sports and to finding the level of speed development in primary school students in the Neamț County.

## ***Objectives of research***

- to find out the teachers' opinions with respect to practising roller skating;
- to know the level of somatic, motor, and functional development of primary school students.

The subjects in the two studies were 14 physical education and sport teachers and 578 primary school students in Piatra Neamt. The research was conducted in five schools in the county of Neamt during the 2012-2013 school year, when teachers' opinion questionnaires were applied and initial and final tests in the established evaluation tests were conducted.

In order to highlight the particular traits of primary school students I used: **somatic measurements** (height, weight, and body mass index), **functional** (heart frequency, breathing frequency, and Ruffier test), and **motor events** (5x5m shuttle, 25m sprint, 25m skate rolling, standing throw of oina ball, standing long jump, crunches, back extension, 600m endurance, Matorin test).

## ***Conclusion of the research of the level of speed development***

In terms of the somatic and functional development of the students in the county of Neamț, we can assert that it ranges within the national values included in the biomotor potential of school population, which validates the first hypothesis.

The results obtained after the evaluation tests were applied revealed significant differences as compared to the data included in the National System for School Evaluation in Physical Education and Sport with reference to:

- in the **25m (s) sprint** event, the values recorded ranged between 6,05 (s) for the preparatory grade and 4,84 (s) for the 4<sup>th</sup> grade; these figures could not be compared as the national evaluation system quotes the minimum standards for the "fair" for the 3<sup>rd</sup> and 4<sup>th</sup> grades.

- in the **5x5m (s) shuttle event**, the values recorded ranged between 13,07 (s) in the preparatory grade and 9,84 (s) in the 4<sup>th</sup> grade, which do not correspond to the minimum standards for "fair", which we consider extremely high, even unfair.

## ***Conclusions and suggestions of preliminary research***

The study related to knowing the opinions of the teachers in the Neamt County with respect to practising alternative/seasonal sports and the study related to primary school children' level of development highlighted the following conclusions:

- teachers consider that it is possible to conduct activities related to alternative/seasonal sports in the physical education classes as they create an

appropriate affective – emotional among students and practising such sports determines influences on reducing the number of medical exemptions;

- teachers consider that the means specific to alternative/seasonal sports add to the effects produced to those that are mandatory in the curriculum, contributing thus favourably to obtaining influencing which physical education produces with respect to motricity, physical and psychological development;

- the hypothesis according to which in the Neamt County there is a tendency to practise alternative sports by a low number of teachers was confirmed;

- the students' development in the Neamt County ranges within the national values in terms of biomotor potential of the school population, which validates the second hypothesis according to which the somatic and functional development of the students in the Neamt County ranges within the national values of the school population in Romania;

- the level of speed development is on the rise from the preparatory grade to the forth grade, which validates the first part of the third hypothesis;

- taking into account that the results recorded in the shuttle sprint tests are clearly inferior to those provided for in the National Evaluation System, we ascertain that they do not validate the second part of the third hypothesis, according to which these results range within the values stated in the National Evaluation System for Physical education.

In order to have an accurate evaluation we propose:

- the revision of and additions of real values to the national evaluation system; such values should include at least the minimum standards for the “fair” grade in the preparatory grade;

- the realisation of experimental research that would focus on the development of speed by using means specific to roller skating.

Part III: **THE EXPERIMENTAL RESEARCH** includes three chapters: **Chapter 11**: Operational framework of the research; **Chapter 12**: Findings of the experimental research; **Chapter 13**: General conclusions, new elements, and dissemination of activity.

### ***Purpose of research***

The purpose of the research is to highlight the optimisation of the primary school students' speed by using roller skating as alternative sport in the physical education classes.

### ***Objectives of research***

- application of the school curriculum with roller skating as alternative sport;
- highlighting the improvement of speed as a result of the application of the curriculum.

### *Hypotheses of research*

- *use of means specific to roller skating to optimise the general motor capacity;*
- *use of drills on rollers contributes to improving speed in running tests;*
- *use of drills on roller skates contributes to improving the speed in the skate rolling tests.*

The research was conducted at Școala Gimnazială Nr. 11 in Piatra Neamț during the first and second term of the school year 2013-2014 and was structured in the following *stages*:

- application for the principal's approval to conduct the research – **2 September 2013**;
- discussions with the physical education teacher in charge of the primary school grades; this teacher will also be in charge of the preparation of the control group - **3 September**;
- organising the sports facility where the control events will be conducted **9-14 September** – marking the roller skating lanes – width 1,20m;
- selection and establishing the control events to be conducted on **16-17 September**;
- selection of the sample group to participate to control tests and events established **18-19 September**;
- presentation, justification and analysis of control tests to be conducted with the students in the experimental group in parents' meeting with a view to obtaining the agreement to conduct such tests **20-24 September**;
- verification the medical approval documents, i.e., “able for physical effort” or “healthy from a clinical point of view” **25-30 September**;
- conducting the control tests and somatic measurements contained in the initial testing **7-25 October 2013**;
- devising and applying the applicative intervention according to the results obtained in the initial testing **28 October 2013 – 15 November 2013**;
- conducting the final tests and somatic measurements; recorded between **12 May - 30 May 2014** final testing;
- processing and interpreting the experimental data.

The subjects included in the experimental research were 234 primary school students at Școala Gimnazială Nr. 11 Piatra Neamț, where I teach. The students were divided into two groups – experiment and control; they underwent a preparation programme as per school curriculum. Each group contained five classes.

In the experimental groups, I focused on finding the efficiency of exercises/drills specific to the alternative/seasonal sports, roller skating on the development of speed, the independent variable, introduced during a school year at all primary school levels. All classes underwent initial and final control tests in order to compare the results recorded. The difference of the results was monitored to ascertain the surplus of speed in the experimental groups, the dependent variable of this research.

The students' somatic development was appreciated by measuring height and weight, and for the motor development, we chose evaluation tests such as 30m (s) sprint, 30m (s) skate rolling, 300m (min) endurance running, 300m (min) skate rolling, standing throw of oina ball (m), standing long jump (cm), raising knees at 90° from hanging on the fixed ladder, number of repeats/30 (sec), side to side hops/number of repeats/30 (sec), 30m (s) slalom, Matorin test (degrees).

### ***Conclusions of experimental research***

The analysis of the experimental research results highlighted, by means of the high progress recorded in the experimental groups as compared to the control ones, the optimisation of the primary school students' general motor capacity owing to the use of roller skating specific means in the physical education class. The values of the riding speed are higher in the motor running tests and on roller skates, thus demonstrating the speed increase monitored in the research.

In terms of the students' ***somatic development***, appreciated by measuring the height and weight, we found increases both in the experimental groups and the control ones. Height and weight range as follows: the preparatory grade: between 1,10 (cm) and 1,26 (cm) and 17 (kg) and 23 (kg); first grade: between 1,10 (cm) and 1,35 (cm) and 17 (kg) and 45 (kg); second grade: between 1,20 (cm) and 1,40 (cm) and 20 (kg) and 46 (kg); third grade: between 1,26 (cm) and 1,49 (cm) and 26 (kg) and 51 (kg), fourth grade: between 1,30 (cm) and 1,56 (cm) and 35 (kg) and 48 (kg).

The appreciation of the ***motor development*** by means of the ten tests highlighted the following aspects:

- in the ***raising the knees to 90° from hanging (number of repeats)*** test, the girls recorded progress ranging between 2,31 and 2,93 (repeats) in the experimental groups and between 1,92 and 2,23 (repeats) in the control ones, whereas the progress recorded by the boys ranged between 2,10 and 3,10 (repeats) in the experimental groups and between 1,27 and 2,00 (repeats) in the control ones;

- in the ***standing long jump (cm)*** test, the progress recorded by the girls ranged between 0,09 and 0,17 (cm) in the experimental groups and between 0,07 and 0,12 (cm) in the control ones, whereas the progress recorded by the boys ranged between 0,09 and 0,17 (cm) in the experimental groups and between 0,07 and 0,11 (cm) in the control ones;

- in the ***side to side hops (number of repeats)*** test, the girls recorded progress ranging between 3,29 and 4,20 (repeats) in the experimental groups and 2,74 and 3,77 (repeats) in the control ones, whereas the progress recorded by the boys ranged between 4,17 and 7,20 (repeats) in the experimental groups and 2,57 and 4,11 (repeats) in the control ones;

- in the ***30m (s) sprint*** test, the girls recorded progress ranging between 0,11 and 0,19 (s) in the experimental groups and de 0,02 and 0,13 (s) in the control ones, whereas the progress recorded by the boys ranged between 0,07 and 0,24 (s) in the experimental groups and de 0,5 and 0,11 (s) in the control ones;

- in the ***30m (s) skate rolling***, the girls recorded progress ranging between 0,08 and 0,30 (s) in the experimental groups and de 0,07 and 0,25 (s) in the control

ones, whereas the progress recorded by the boys ranged between 0,11 and 0,36 (s) in the experimental groups and de 0,08 and 0,21(s) in the control ones;

- in the ***standing throw of oina ball (m)*** the girls recorded progress ranging between 2,54 and 3,36 (m) and de 1,74 and 3,14 (m) in the control ones, whereas the progress recorded by the boys ranged between 2,37 and 4,80 (m) in the experimental groups and de 1,37 and 2,56 (m) in control ones;

- in the ***300m endurance running (min)*** the girls recorded progress ranging between 0,02 and 0,04 (min) in the experimental groups and de 0,02 and 0,04 (min) in the control ones, whereas the progress recorded by the boys ranged between 0,03 and 0,04 (min) in the experimental groups and 0,01 and 0,02 (min) in the control ones;

- in the ***300m (min) skate rolling***, the girls recorded progress ranging between 0,05 and 0,08 (min) in the experimental groups and de 0,01 and 0,06 (min) in the control ones, whereas the progress recorded by the boys ranged between 0,09 and 0,15 (min) in the experimental groups and de 0,01 and 0,03 (min) in the control ones;

- in the ***30m (s) slalom***, the girls recorded progress ranging between 0,13 and 0,42 (s) in the experimental groups and de 0,08 and 0,26 (s) in the control ones, whereas the progress recorded by the boys ranged between 0,07 and 0,49 (s) in the experimental groups and de 0,04 and 0,19 (s) in the control ones;

- in the ***Matorin test*** (degrees), the girls recorded progress ranging between 32 and 63 (degrees) in the experimental groups and between 13 and 54 (degrees) in the control ones, whereas the progress recorded by the boys ranged between 18 and 65 (degrees) in the experimental groups and de 40 and 70 (degrees) in the control ones.

In conclusion, the hypothesis according to which *the use of roller skating specific means contributes to optimising the general motor capacity* is validated, as progress is higher in all tests in the experimental groups as compared to the control ones.

In the ***30m (s) sprint*** test, the riding value is higher in the experimental groups (ranging between 4,66 – 5,74 m/s for girls, and between 4,68 – 5,57 m/s for boys), as compared to the control ones (i.e., 4,36 – 5,30 m/s for girls and 4,58 – 5,11 m/s for boys), which demonstrates that the hypothesis according to which *the use of drills specific to roller skating contributes to a much greater improvement of the speed in the running, in the experimental groups as compared to the control ones* was validated.

Considering that in the ***30m (s) slalom*** test the value of the travelling value speed is higher than in the experimental groups (ranging between 2,94 – 4,10 m/s for girls and 2,95 – 4,01 m/s for boys) than in the control ones (i.e., 2,85 – 3,53 m/s for girls and 2,81–3,30 m/s for boys) and ***30m (s) slalom*** test the value of the travelling speed indicates significant differences in all experimental groups (ranging between 2,94 and 4,10 m/s for girls and 2,78 – 3,28 m/s for boys), as compared to the control ones (de 2,85 – 3,53 m/s for girls and 2,52 – 3,00 m/s for boys), we can assert that the hypothesis according to which *the use of drills specific to roller skating contribute to*



*the significant improvement of the riding speed in all tests on rollers in the experimental groups, as compared to the control ones* was validated.

To conclude, the specific means of alternative/seasonal sports are more efficient and have a greater contribution to meeting the objectives set in physical education.

### ***General conclusions***

Following the research conducted, we highlight the relevance of the following conclusions:

- the great majority of teachers consider the approach of alternative sports as necessary but the lack of curriculum represent an impediment;
- the use of roller skating as an alternative subject contributes to the improvement of the general motor capacity;
- the use of roller skating as an alternative subject contributes to the improvement of speed both in running and on roller skates and running;
- the use of roller drills contributes to a greater extent to improving of riding speed in 30m sprint and in the 300m endurance running events;
- there is a demand for diversified learning content in the curriculum in the preparatory grade and a curriculum for roller skating as well as an evaluation system for primary school grades, including the preparatory one;
- currently, diversifying the contents for physical education is a necessity – children get bored.