

MINISTRY OF EDUCATION, RESEARCH, YOUTH AND SPORT
NATIONAL ACADEMY OF PHYSICAL EDUCATION AND SPORT

PHD THESIS ABSTRACT

SCIENTIFIC SUPERVISOR: Prof.Univ.Dr. MARINESCU GHEORGHE

PHD STUDENT: **OPREA LAURENTIU**

THESIS TITLE: **ANALYSIS AND IMPROVEMENT OF THE MEASUREMENT
AND ASSESMENT IN PHYSICAL EDUCATION AT PRIMARY SCHOOL**

Keywords: measurement, assessment, physical education, primary education

INTRODUCTION

Regarding the education system reformation, the problems of assessing the learning outcomes are very important for increasing the efficiency of educational process in pupils' general training of the XXI century.

The reasons for developing this topic are: the immediate transition to school programs based on training and basic education skills for primary school, as well as the need for an unitary evaluation system, leading to the possibility of issuing assessments on the overall results of the process of education to physical education at primary school.

Transferable skills training, ensuring the motility development and also the global one generally speaking, but with intentional orientation, must definitely be a priority in physical education at primary level.

PART I

THE THEORETICAL, CONCEPTUAL AND METHODOLOGICAL FRAMEWORK

- ❖ **PURPOSE OF THE THESIS** : evaluation and improvement of the evaluation system in physical education at primary school, according to current requirements and guidelines.
- ❖ **OBJECTIVES** :
 - Identifying trends, conceptual and pragmatic guidelines regarding the role and purpose of physical education in school, in general, and the physical education from the primary cycle, in particular.
 - Improving the evaluation system at primary school
- ❖ **TASKS** :
 - Information and documentation reference regarding the theoretical, conceptual and methodological aspects related to the learning phenomenon and to the assessment systems of the school results;
 - Studying the programs and evaluation systems from different countries, compared with those of our country.
 - Transversely study regarding the learning results in physical education at primary school, study conducted on representative samples.
 - Carrying out a project perfected by measuring and evaluating of the learning results in primary school.
- ❖ **Some characteristic and conceptual aspects regarding the learning phenomenon**
 - We briefly examined some aspects of this phenomenon in order to put in perspective their reasonable problems related to the assessment of learning
 - the nature of the learning phenomenon
 - diversity of school learning
- ❖ **Characteristics of measuring instruments**
 - The own function of measuring or observation instruments is essentially about providing relevant and accurate information allowing issuing judgments on the learning process and therefore making clarified decisions.

❖ **Evaluation of school learning programs focused on the objectives and skills**

In this chapter are presented the principles that sustain the formulation of objectives and skills, as well as the evaluative approach regarding the learning process.

❖ **Theoretical considerations on the particular somatic and psychomotor functioning of children aged 6 -10 years**

We took into consideration the main aspects which offer the morphologic, functional and psychological basic of the physical education process in primary cycle, process which must be mainly situated on the psychomotility and global motility level, but in the context of educational directives that put in the spotlight the necessary skills training for effective and productive social inclusion.

The main sources of information have been created from the works of renowned authors, of whom we mention Demeter, A., (1981), Weineck, J (1990), Tourette, C., and Guidetti, M. (1995), Rigali, R ., (1995), Wilmore, JH and Costill, DL (2002), Ardelean, T. (2007).

Being an academic course, the physical education's main purpose is to ensure the education and development of fine and global motility with intentional orientation, thus ensuring the premises of a high level behaviour, premise of the performances, applied to the most various areas of social practice.

❖ **The topic's statement in literature. The analysis of evaluation programmes and systems for physical education at primary school in different countries**

There are shown the results of a vast information activity and bibliographic documentation, regarding programmes or curriculums, for elementary school from France, Switzerland, Hungary, Canada, USA, as well as the evaluation systems accompanied by comments and then it is presented the curriculum and evaluation system in our country.

**PART II
PRELIMINARY OPERATIONAL RESEARCH
TRANSVERSAL PRELIMINARY STUDY ON SAMPLING AND APPLICATION
OF EVALUATION TESTS**

❖ **The objective of the preliminary study**

Sampling verification and application of evaluation tests in order to prevent future errors

❖ **Purpose:** Finding the optimal ways to achieve the final transversal study

❖ **Study Tasks**

- Experiencing the sampling procedures and ways of implementaing the set of evaluations tests;

- Complete sampling process, the content control system and methodology of evidence of their administration.

❖ **Organization and research, topics and samples development**

The research has been conducted in the sectors of Bucharest, mainly at elementary schools or in the high schools that are also elementary schools. These samples were subjected to the National Evaluation System in collaboration with teams of teachers who teach physical education in elementary school.

Research data collection was planned in advance and was performed during the second semester of 2008.

❖ **Conclusions of the preliminary study**

Under the operation conditions of data collection, measurement and evaluation, there are required only the following conclusions:

- The errors discovered and reported regarding the collection, measurement, and especially the evaluation of data are information beneficial for the organization, design, collection, measurement and evaluation of data especially in the final study.
- The final study data collection was done with great accuracy and sense of responsibility. To this end we have thoroughly trained teachers in data collection teams, exemplifying through the errors in data collection and centralization of the preliminary study, issues which will be specified below.
- In the interest of action research, there was a need for clarifications, corrections or additions to all evaluation tests.
- It is necessary to have a grid of points which can then be converted into marks, depending on the student.
- For the final study there will be carried out grids of assessment of learning outcomes in proof, in collaboration with specialists, A complex of physical development, self and objects, elements of gymnastics. acrobatics, gymnastics acrobatics link elements, elements of sports games and sports games structures.
- In terms of applying the correct methodology, the final study results will be grounds for a meaningful analysis of the current assessment system.

PART III

PERSONAL CONTRIBUTIONS TO RESEARCH ACHIEVEMENT

This third part of the thesis is, according to the general objectives and tasks of the work, focused on the idea of improving the assessment system for primary school, thus carrying out the transversal studies regarding the learning outcomes and development of improved measurement and assessment of learning outcomes at primary cycle, which will be available for guidance and control.

TRANSVERSAL FINAL STUDY ON LEARNING OUTCOMES IN PHYSICAL EDUCATION AT I-IV GRADES

❖ **Tasks**

- Data collection according to the sampling scheme
- Statistic treatment of the data;
- Develop objective scales of assessment of learning outcomes

❖ **Research hypothesis**

In recent years, many educational systems are geared towards building competency-based curricula. Competence can be defined as ... **"To know what to do** with any number of

resource mobilization to meet a set of circumstances. " Thus can be stated the following general hypothesis:

"The current measurement and evaluation system does not provide, only partly, useful information in assessing the learning outcomes. "

This concerns, in particular, the scope of basic driving skills, mobilizing abilities and utility applications skills.

Organization and conducting research, subjects, sampling

The research has been conducted in the second semester of 2008-2009 school year and in the study were assessed a number of 800 pupils from I-IV grades, selected from schools in Bucharest. Sampling was done through a stratified sampling method (random rate), and the socio-demographic variables were: the basic material conditions of the school (very good, good, satisfactory), sex and class.

800 subjects/20 pupils (average actual per class) results in 40 classes, a figure provided by adjusting the percentage of classes reported on three conditions: $800 \times 43\% \times 20\% \times 37\% = 17.2$ (16 classes) 8 (8 classes) 14.8% (16 classes) and a number of 8 - 4 - 8 schools. We used the following methods of research: bibliographic study, test method, statistical and mathematical methods of data processing.

The tests used for evaluation were the control samples from the National System of Evaluation in Physical Education for I-IV grades.

Taking into consideration the conclusions of the preliminary study which said that it is necessary to have a scoring grid which can then be converted into marks, for each student, I passed through their development. Thus, the competences assessment was done after the scale skills for assessing students following: acrobatics gymnastics elements, elements of sports games, complex physical development, with and without objects; binding elements of acrobatics and gymnastics sports games structures.

In the program of mathematical statistics were calculated averages, median, standard deviation, a simple variation of coefficient of variation for each variable, then the calibration results by quartiles and deciles was done.

And on this occasion, the investigating teams preparation level of students were composed of trained physical education teachers who teach in grades I-IV.

❖ Results of the study, data analysis and interpretation

Data collected were subjected to analysis and interpretation of the following:

1. Dynamic driving capabilities and skills, as reflected by the values of statistical indicators in relation to age (grade) and sex of students.

2. Analysis of the average change, the coefficients of variation of the four classes and frequency curves between grades I - IV, at the two sexes

-Running speed increases steadily with age pupils. The relative values of the fourth class speed increase compared to the first grade, it's 8.7%.

-Resistance cardiovascular-term effort, with a little stagnant in grade III, has the same dynamic trend. On the fourth grade the increases with 29%.

-Abdominal muscle strength and endurance, increased in flare-ups, at grade II and grade IV, where it is found the highest growth. During class I - class IV, the increase is 34.2%.

-On the lower back muscles, only the fourth grade is a significant increase in muscle capacity, indicating an increase in the relative value of 39%.

-Neuro-muscular strength and endurance of upper and lower limbs has a continuous upward dynamic similar to the three samples involved in grade I to grade IV including (we consider also the test alternative jumping). The relative value is 40.3% in traction, momentum 14.5% length without jumping and 62.6% alternative.

-Targeting ability of throwing movements marked increases only in grades III and IV. The rise in the relative value is 10.5% .

3. Comparative analysis of performance according to the basic material requirements of school

It results that from a total of 104 values that characterize the level of preparedness of students, 44.23% come from schools with "**very good conditions**", 34.61% of schools with "**good condition**" and only 21.16% of schools with "**satisfactory conditions** "

4.Models of assessing the grid capacity and motor skills.

- System based on quartiles, with four ranges of values.

It operates with five shares of series of variable values: Xmin, Q1, Q2 (median), Q3 and Xmax

Array Formula in Excel calculation is as follows:

a)Normal version

= Min(E ₂ : E ₉₀)	= Quartile(E ₂ : E ₉₀ , 1)- 0.01	Insuficient
= Quartile(E ₂ : E ₉₀ , 1)	= Quartile(E ₂ : E ₉₀ , 2)- 0.01	Suficient
= Quartile(E ₂ : E ₉₀ , 2)	= Quartile(E ₂ : E ₉₀ , 3)- 0.01	Bine
= Quartile(E ₂ : E ₉₀ , 3)	= Max(E ₂ : E ₉₀)	Foarte bine

b) Version for the tests where are preferred the small absolute values, in what speed tests regard.

= Min(E ₂ : E ₉₀)	= Quartile(E ₂ : E ₉₀ , 1)- 0.01	Foarte bine
= Quartile(E ₂ : E ₉₀ , 1)	= Quartile(E ₂ : E ₉₀ , 2)- 0.01	Bine
= Quartile(E ₂ : E ₉₀ , 2)	= Quartile(E ₂ : E ₉₀ , 3)- 0.01	Suficient
= Quartile(E ₂ : E ₉₀ , 3)	= Max(E ₂ : E ₉₀)	Insuficient

(E₂: E₉₀, 1,2,3) - means that the series of variables is entered in column E Excel tab between the positions 2-90, and the numbers indicate the order of quartiles.

The results were achieved for all samples scale assessment valid for all classes of grid model

no.2.

- 10th based system, with ten values (optional version)

Computing operations:

1. Sorting ascending string variable;
2. $(X_{max} - X_{min}) / 9$ decile interval difference;
3. Values of the deciles, using the X_{min} value and the difference in the series range of variables that can be calculated directly in Excel.

CONCLUSIONS

-Theoretical and methodological conclusions

1. In the modern world a first-rate importance is given to the education phenomenon. It unreservedly supports the concept of lifelong learning, which suggests a continuous learning.
2. Physical education and sports are considered indispensable for the development of individual personality. Development of physical, intellectual and moral life by physical education and sport, is a right and must be guaranteed within educational systems.
3. Physical education is an integral part of the overall education program for each student and provide more opportunities for each student to develop their skills, knowledge and confidence necessary to lead a physically active lifestyle.
4. By analogy with other forms of education, morals, music, art etc, it has become desirable and promoted the phrase "physically educated" as a component of general education, global and multilateral, of any individual.
5. The term "performance - powertrain by analogy with" performance - intellectual "or" performance - artistic, is more often circulated in the literature and should be considered as one of the final priority of school physical education, including primary education.
6. Conceptual and theoretical framework of this thesis finds its origins in the "International Charter of Physical Education and Sport" adopted at the General Conference of the United Nations Educational, Scientific and Cultural Organization at its twentieth session, Paris 21 November 1978.
7. Under the aegis of UNESCO, Delors Commission - 1996, incorporating the importance of education to develop all regions of the world, has proposed four major orientations: learning **to know**, learn in order **"to do"** learn **"to be"** and learn to **"live together"**.
8. Lately, in many western countries and elsewhere, most school reforms are focused on promoting and developing the directive "to know what to do" in the sense that it is most suited to the demands of our century.
9. Human performance measurement and evaluation is, in scientific activity, a prime concern.
10. As a consequence, in recent years, many educational systems are geared towards building competency-based training programs
 - 10.1. A competence can actually be regarded as a result from the interaction of knowledge, skills, abilities and attitudes that can be mobilized to achieve a complex task
 - 10.2. A very important aspect concerning jurisdiction is to consider attitudes as part of competence, rather than learning itself isolated.
11. In the school physical education area in general, but especially in primary and secondary cycle, the curriculum reform seeks to address two key issues at this stage:
 - a) Statute of physical education as an academic discipline;
 - b) Guidance curriculum and teaching content for training skills.
12. Physical education is a sustainable education, learning situations are placed and built on transferable skills, rather as technical and tactical learning sports skills which can be pursued, pursued beyond, outside of class.

13. As an academic discipline, physical education has the purpose to assure the development of motility rather than the global (coarse), in general, but with intentional orientation.

14. Intentional orientation, especially of motility development, ensures the premises of a high-level motor behavior, an indispensable condition for achieving performance - engine, implemented in the various fields of social practice.

- **Conclusions induced on the research results**

1. Pilot study results have provided bases for the correction of methodological deficiencies.

2. A general hypothesis confirmed that: "The current system provides measurement and evaluation ensures only partly the useful information in assessing learning outcomes.

3. Learning outcomes consist mainly of the values of statistical indicators, the analysis of frequency curves and different morphology assays.

Regarding our study, the morphological analysis of the frequency curves is an important operation to establish the type of distribution in the range of variables, compared with a normal distribution.

It was established that at most of the evidences on which the measurement was not done on the system centimeter, gram, second, at all classes and both sexes, prevails the right asymmetric distributions, then the excess and, amid more evidence of bimodal or multimodal distribution .

The significance of these deviations with respect to a normal distribution can mean phenomena typical for the age of the subjects, but also methodological weaknesses of evidence and apply the criteria (scales 1-5) evaluation of the evidence.

4. Descriptive analysis of statistical indicators has been considered a secondary task and relatively optional. We took into account the average and coefficient of variation similar to the 8 samples from all classes and both sexes.

4.1. For boys, the mean motor capacity of grade I to IV - except such evidence - "haul back log of lying" and "lying in the trunk of the facial extensions" is steadily increasing. At first with increasing values swing, and the second, relatively comparable in grades I - III with a spurt in the fourth grade.

4.2. For girls, the mean driving skills is steadily growing at: "shuttle", "traction", "lifting the trunk of lying back," extensions of the trunk of the facial bed, "standing long jump" and "Jumping alternative. As for the "running of the period", the higher value is at grade III and for the " throw the target " at grade II.

5. For boys, the comparison of correlation coefficient between grades I and IV shows that at all samples , the reduction of the amplitude scattering series, the most significant being the long race.

For girls, the same comparison offers a different picture. At three samples "lifting of the trunk of lying back, "extensions of the trunk of the facial lying" and "shot on target", the scattering amplitude in series is significantly larger.

6. Comparative analysis of performance against the "basic conditions of school material", indicating that this factor was not an objective or task of the research, shows that a total of 104 values that characterize the level of preparedness of students, 44.23% from schools with "**very good conditions**", 34.61% of schools with "**good condition**" and only 21.16% of schools with "**satisfactory conditions** "

7. Looking at the valid number of samples by class and gender, it was found that in most classes, the total valid samples are between 10 to 11. Two grades, I boys and III girls, there are

9 samples and only 7 girls in the class I evidence.

8. The series reconstruction, at all samples with $CV > 30 - 33\%$, similar in number to other samples .

- Personal contributions and the degree of originality of work

1. Programs and assessment systems study in many countries.

2. It is the first time when such a research extends at physical education in primary school.

3. In its current form, the thesis contains all the essential elements for a document processing system of physical education assessment at the primary discipline and can be made available to decision makers, with the following **proposals**:

a. It must increase the weight of evidence of skills in all grades and both sexes;

Thus, it is intended to replace the "jumping alternative" at all grades and both sexes and evidence of "lifting of the rear trunk of lying" and "extensions of the trunk of the facial lying" in class III - IV, with evidence of competence, with motility profiles fine manual skill and motor learning, differentiated by sex.

b. Implementation of scales for assessing the implementation of the evidence:

→ physical development complex

→ isolated elements of acrobatics gymnastics

→ techniques procedures in a sports game

→ technical structures of a sports game

→ binding elements of acrobatics gymnastics

c. Development of scales, as the models presented in the thesis.