

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

PHD THESIS ABSTRACT

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**THESIS TITLE: THE ADJUSTMENT OF THE PHYSICAL EDUCATION AND
SPORT CURRICULUM TO CHILDREN WITH SEVERE MENTAL
DEFICIENCY, AGED BETWEEN 10 AND 16 YEARS**

**KEYWORDS: ADAPTED PHYSICAL EDUCATION, SEVERE MENTAL
DEFICIENCY, BIOMOTOR POTENTIAL, MOVEMENT QUALITIES,
CURRICULUM, SYLLABUS**

INTRODUCTION

In accordance with the decisions to change the educational system in Romania, we launched an education reform to adapt the Physical Education and Sport curriculum to students with severe mental deficiency.

The small amount of information and the small number of studies published in the speciality literature related to the motility of children with severe mental deficiency made us ask what is the profile of a student who graduates from the special education? Does the actual curricular approach, both in terms of national syllabus and school curriculum, help us shape this profile at the end of the school year?

Taking these questions as a starting point, we considered it appropriate to shape the biomotor profile of the child with severe mental disability in relation to the biomotor profile of the child from the mainstream to diagnose the significant differences in terms of movement abilities between the two categories of subjects so that we can then apply adjusted stimulation programs in order to reduce these differences.

In the end, we intend to develop curricula for Physical Education and Sport, special education, secondary level, formulating general and special competences and proposing examples of activities so that each content category of the discipline could be acquired.

PART I

The Theoretical, Conceptual and Methodological Framework

In **Chapter I** we presented the authors from the speciality literature approach on physical education system in Romania. We presented the objectives, the functions and the purposes of physical education, the components of the education process in physical education, all these being also detailed for the special education.

Chapter II deals with the concept of curriculum, both in terms of terminology and philosophy and also in terms of its components, analyzing the curriculum applied in the special education system in Romania. In the end of this chapter we made a critical analysis of national syllabi and school curricula currently in use for students with severe mental deficiency, secondary level.

The **Chapter III** carries out a complex characterization of children with mental disability aged between 10 and 16 years. Following the conceptual delimitations we presented the latest information concerning the frequency and dynamics of mental deficiency in the school population in Romania, specificity, etiology, characteristics and classifications of mental deficiency. To draw up a complete portrait of the child with mental deficiency, in the end of this chapter we presented the cognitive features of the children with mental disability, compared with students enrolled in mainstream school and the motricity characteristics of the children with mental deficiencies.

Chapter IV covers modern approaches of the motor qualities of the children aged between 10 and 16 years, presented in the international speciality literature and in the works of the Romanian authors. After creating the conceptual delimitations, we have presented the latest information related to the motor skills: speed, endurance, strength, suppleness and coordinating skills, describing the level obtained by the students with severe mental deficiency.

Also, in the end of the chapter we present aspects related to the growth and the development of children aged between 10 and 16 years, focusing on the students with severe mental deficiency.

PART II

Research and Preliminary Results – The biometrical potential of students with severe mental disability, compared with that of students enrolled in mainstream school, aged 13 years

Chapter V proposes the review and the application of the evaluation methods and tests which will be used in the first investigation, the selection of the statistical tests and their use in the analysis of the data collected from the pilot study sample.

The research was conducted on a sample made of few subjects, between 15 September and 1 November.

We used the following methods of research: bibliographic study, test method, statistical and mathematical methods of data processing.

The tests used for evaluation in order to shape the biomotor profile for the two categories of subjects were as follows: the biometric potential of the school population (anthropometric measurements, running speed), Brockport test battery (running resistance in an imposed tempo, body mass index, body composition, the muscle strength of the upper limbs and chest, mobility of the spine in extension and paravertebral muscles strength, the force of the abdominal muscles, scapulohumeral joint mobility, coxofemoral joint mobility) Matorin test and Eurofit test battery (Flamingo balance test).

The data collected were processed using S.P.S.S. statistical program 16 for Windows. The statistical – mathematical program calculated the averages for each variable and the Mann-Whitney test (chosen from all the nonparametric tests for ordinal dates) was applied to two independent samples.

The conclusions of the pilot experiment invalidate the first hypothesis of the pilot study that states that between the male students with severe mental disability and the male students enrolled in the mainstream school, having 13 years old, there are significant differences in terms of anthropometric index.

The second hypothesis of the pilot experiment also refutes itself, there being significant differences in terms of certain components of the motric ability between the male students with severe mental disability and the male students enrolled in the mainstream education, at the age of 13. In this case, the first and the second research hypothesis become valid.

PART III

Experimental research on the biomotor potential of the students with severe mental disability and specific ways of stimulating them

The IIIrd part of the thesis consists of two separate investigations. They were conducted on different periods of time and they have different goals, assumptions, samples, results and conclusions. The two inquiries are interconnected, the results of the first research influencing the formulation of the hypotheses of the second research.

In order to develop a curriculum that reflects the actual level of the biomotor potential of the students with severe mental disability, we considered it appropriate to capture some significant differences between students with severe mental disability and students enrolled in the mainstream school.

Thus, the first research conducted during the school year 2008 - 2009 is a transversal study in which the biomotor potential of the students with severe mental disability is compared with that of the students enrolled in the mainstream school.

After identifying some significant biomotor differences between the two categories of subjects, we wondered whether these differences can be improved by applying a specific stimulation program with specific means of physical education. Can students with severe mental disability improve their motor abilities? Is it necessary that this category of subjects should be stimulated more than they are now?

The second research was conducted during the school year 2009 - 2010 and it is a longitudinal experiment. It was demonstrated during the research that the application of some stimulation programs tailored to groups of students having the same level of motor abilities and the implementation of some additional activities over those listed in the curriculum may lead to the improvement of some components of the motric ability.

Biomotor potential of students with severe mental disability, compared with that of students enrolled in the mainstream school - Research I

In **Chapter VI** we wanted to shape the biomotor profile of children with mental disability from the special education school and the comparison with the biomotor profile of the children from the general education system in order to diagnose any differences.

During 2008 - 2009 school year, there were selected using statistical step method and evaluated a total of 240 students at secondary school, educated in six school units.

The research methods used were: bibliographic study, test method, statistical and mathematical methods of data processing.

The batteries of tests used for evaluation in order to shape the biomotor profile of both the child with severe mental disability and the child enrolled in the mainstream school were the following: the biomotor potential of school population (anthropometric measurements, running speed, hand and leg coordination), Brockport test battery, Matorin test and Eurofit test battery (Flamingo balance test).

The data collected were processed using S.P.S.S. statistical program 16 for Windows. The statistical – mathematical program calculated the averages for each variable and the Mann-Whitney test was applied to two independent samples.

The following table presents the results of the comparisons between the values obtained by the subjects with severe mental disability and the students enrolled in the mainstream school.

Table 1. Results for Research I

No.	Tests and Evaluation Tests	5B	6B	7B	8B	5F	6F	7F	8F
1.	HEIGHT	X	•	•	X	•	X	•	X
2.	BODY HEIGHT	•	•	•	•	•	•	•	•
3.	WEIGHT	X	•	•	•	•	•	•	X
4.	THORACIC ELASTICITY	X	•	•	X	X	X	•	X
5.	RUNNING SPEED - 20M	X	X	X	X	X	X	X	X
6.	MANUAL COORDINATION	X	X	X	X	X	X	X	X
7.	LOWER STATE COORDINATION	X	X	X	X	X	X	X	X
8.	20M - PACER	X	X	X	X	X	X	X	X
9.	BODY MASS INDEX	•	•	•	•	•	•	X	•
10.	TRICEPS SKINFOLD	•	•	•	•	•	•	•	•
11.	SUBSCAPULAR SKINFOLD	•	•	•	•	•	•	X	•
12.	CALF SKINFOLD	X	•	•	•	•	•	•	•
13.	BENCH PRESS	X	X	X	X	X	X	X	X
14.	RIGHT GRIP STRENGTH	X	•	X	•	X	X	X	X
15.	LEFT GRIP STRENGTH	X	•	X	•	X	•	X	X
16.	ISOMETRIC PUSH-UP	•	X	X	X	X	X	X	X
17.	EXTENDED ARM HANG	•	X	X	X	X	•	X	X
18.	PULL-UP	•	X	X	X	X	•	X	X
19.	TRUNK LIFT	X	X	X	X	X	•	X	X
20.	MODIFIED CURL-UP	X	X	X	•	X	X	X	X
21.	SHOULDER STRETCH	X	X	X	X	X	X	X	•
22.	BACK-SAVER SIT AND REACH	X	•	X	•	X	X	X	X
23.	MATORIN TEST	X	X	X	X	X	X	X	X
24.	FLAMINGO TEST	X	X	X	X	X	X	X	X

Legend:

X – there are statistically significant differences between the two groups

• - there are no statistically significant differences between the two groups

After analyzing and comparing the data obtained we concluded that the significant differences in terms of motor qualities between the students with severe mental disability, enrolled in special education system and the students enrolled in the mainstream school refer to speed, aerobic strength, the force and the endurance of the upper limbs muscles and coordinating capacity, although in terms of somatic indices there is no major difference.

In these circumstances, the two hypotheses of the research become valid: there are no major differences in terms of anthropometric indices between the students with severe mental disability and the students enrolled in the mainstream school with the age between 10 and 16 years, but there are significant differences in terms of the components of motor ability.

The importance of motor stimulation with specific means of Physical Education and Sports for the child with severe mental disability - Research II

Chapter VII describes the formulation and the implementation of a motor stimulation program aimed to stimulate the motor skills of children with severe mental disability enrolled in special education, a program adapted to the biometric potential of these category of subjects.

The second research was conducted during the school year 2009 - 2010 and it involved 40 students enrolled in the special education system of The Special School no. 11 "Constantin Paunescu".

After the initial assessment, the 40 students were divided into four groups, respecting the criteria of IQ level, the grade in which the subject is enrolled and the development level of the motor qualities.

The evaluation methods used are those given in the Research I, the individual files being structured on two parts: initial assessment and final assessment.

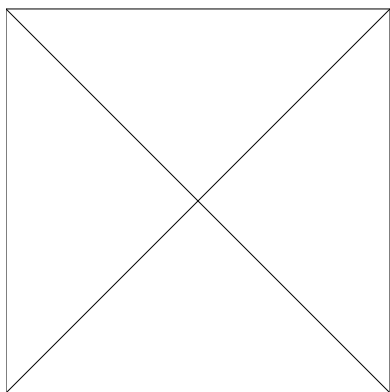
The data collected were processed using S.P.S.S. statistical mathematical program 16 for Windows, Wilcoxon test and the index of "size effect" being also applied.

As for the stimulation program, the children had an adapted Physical Education class per week, plus two Physical Education lessons and sports activities, as per the weekly program of these subjects.

The following table describes the proportion of the content groups covered in the activities.

Table 2. – Calendar table with the themes distribution

Running No.	Group 1	Group 2	Group 3	Group 4
Body Diagram	52,38 %	28,57 %	38,09 %	23,80 %
Laterality	47,61 %	28,57 %	28,57 %	19,04 %
Coordinating capacity	57,14 %	42,85 %	61,90 %	52,38 %
Basic motric skills	80,95 %	42,85 %	85,71 %	38,09 %
Practical motric skills	19,04 %	57,14 %	66,66 %	61,90 %
Resistance	0	100 %	0	100 %



The categories of devices used for the thematic components addressed in the intervention program were the following:

A. Means used to strengthen the psihomotricity components - body schema and laterality

B. Means used to educate the motor qualities - coordinating capacities and resistance

C. Means used to create, consolidate or perfect the basic and practical motor skills

The following table presents the results of comparisons between the values recorded by the subjects with severe mental disability at the initial and final evaluation.

Table 3. Research Results II

No.	Tests and Evaluation Tests	Group 1	Group 2	Group 3	Group 4
1.	HEIGHT	●	●	●	●
2.	BODY HEIGHT	●	●	●	●
3.	WEIGHT	●	●	●	●
4.	THORACIC ELASTICITY	●	●	●	●
5.	RUNNING SPEED - 20M	●	●	●	●
6.	MANUAL COORDINATION	X	X	X	X
7.	LOWER STATE COORDINATION	X	X	X	X
8.	20M - PACER	●	X	●	X
9.	BODY MASS INDEX	●	●	●	●
10.	TRICEPS SKINFOLD	●	●	●	●
11.	SUBSCAPULAR SKINFOLD	●	●	●	●
12.	CALF SKINFOLD	●	X	●	●
13.	BENCH PRESS	X	●	X	X
14.	RIGHT GRIP STRENGTH	●	●	●	●
15.	LEFT GRIP STRENGTH	●	●	●	●
16.	ISOMETRIC PUSH-UP	●	●	●	●
17.	EXTENDED ARM HANG	●	●	X	X
18.	PULL-UP	●	●	●	●
19.	TRUNK LIFT	●	●	●	●
20.	MODIFIED CURL-UP	●	X	●	●
21.	SHOULDER STRETCH	●	●	●	●
22.	BACK-SAVER SIT AND REACH	●	●	●	●
23.	MATORIN TEST	X	X	X	X
24.	FLAMINGO TEST	X	X	X	X

Legend:

X – there are statistically significant differences between the two groups

● – there are no statistically significant differences between the two groups

The analysis and the interpretation of the data obtained after comparing the values recorded by students with severe mental deficiency at the initial test and the values recorded by the same pupils at the final test lead to the following general conclusions:

- after applying the intervention program during the school year 2009 - 2010 there were significant statistical differences between the values obtained at the initial evaluation and the final evaluation for the tests which aimed at testing the manual coordination, the leg coordination, overall coordination and balance. In conclusion, all four groups of students with severe mental disability obtained improved values to the tests which tested the coordination capabilities;

- at the end of the stimulation program, the students with severe mental disability and an IQ between 40 and 49, who used the specific means of aerobic gymnastics during each extra lesson they had, obtained an improved level of the conditional motor quality resistance;

The two assumptions made in the present research are confirmed and the null hypotheses are rejected. Therefore, the introduction of an additional lesson per week of Physical Education and sports activities for an advanced education of the coordination capacities will lead to their improvement and, in the end, to the achievement of the ideal education for this group of subjects and of their social and professional integration.

It was also shown that the application of the specific means of the aerobic gymnastics during that additional weekly Physical Education class has led to a statistically significant increase of the values of the conditional motor quality resistance for students with severe mental disability and an IQ between 40 and 49.

Chapter VIII offers the following concluding observations:

1. between the students with severe mental disability enrolled in the special education system and the students enrolled in mainstream schools there are no major differences in terms of the anthropometric indices that were triggered in the evaluation;

2. the results obtained in the tests that measured the level of the motor skills development showed the fact that between the students with severe mental disability enrolled in the special education system and the students enrolled in the mainstream education there are significant differences;

3. the differences diagnosed between the two categories of subjects were recorded in terms of movement speed, manual and leg coordination, resistance during the running into an imposed tempo test, the force and the muscle strength of the upper limbs, general coordination and balance for all the grades of the secondary level, for both male and female students;

4. in terms of joint mobility, significant differences were recorded between the groups of male subjects for the scapulohumeral joint mobility; in the group of female subjects there were differences in terms of spinal extension mobility;

5. the application of the assessment exams, testing students with severe mental disability and the establishment of the database confirmed the fact that the students with severe mental disability are a heterogeneous group of subjects, both in terms of anthropometric values and in terms of level of the motor qualities development;

6. because the category of the students with severe mental disability is a heterogeneous group in terms of the motor potential, in the same class being enrolled students with various problems, we propose that the design and planning of the instructive educational process at the beginning of each school year to be based on a thorough initial assessment;

7. the low level of the motor qualities development identified for the students with severe mental disability and the low level of their understanding make us propose the introduction in the national curriculum of at least one additional activity besides the two existing ones at this moment;

8. the students with severe mental disability represent a category of subjects that can improve their motor performance;

9. after applying the intervention program during the school year 2009 - 2010, which implied an additional Physical Education and Sports activity, there were recorded statistically significant differences between the values obtained at the initial assessment and the final assessment which referred to hand and leg coordination, overall coordination and balance;

10. at the end of the stimulation program, the students with severe mental disability and an IQ between 40 and 49, who used the specific means of the aerobic gymnastics for each additional hour, exhibited an improved level of the conditional motor quality resistance;

11. the curriculum designers should allocate in the design and planning process a greater number of lessons for the creation, consolidation and improvement of the motor skills and for the education of the motor qualities of students with severe mental disability in comparison with the students enrolled in the mainstream education;

12. Physical Education lessons and sports activities should be carried out with groups of students with a semblable motor potential and level of understanding. Therefore, the units within the special education system should also consider the motor assessment when creating the grades.

Chapter IX describes a curriculum proposal for Physical Education and Sports discipline, special education, secondary cycle, for students with severe mental disability.

The elaborated Physical Education and Sport curriculum has the following structure:

- presentation note;
- general competences;
- values and attitudes;
- specific skills;
- categories of content and ability formation activities on two levels of education: Vth and VIth grades on one hand and VIIth and VIIIth grades on the other;
- methodological suggestions.

The novelty consists in the development of general and specific competences for the discipline of Physical Education and Sports and the proposal of some examples of activities adapted to the biomotor potential of this category of subjects.

Also, another novelty is the fact that the proposed programs have been developed for Vth and VIth grades on one side and for VIIth and VIIIth grades on the other side, the current curriculum being developed for I – Xth grades.