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## STUDY REGARDING SPEED DEVELOPMENT OF VISUALLY IMPAIRED PUPILS FROM 7<sup>TH</sup> AND 8<sup>TH</sup> GRADES USING DIFFERENTIATED INSTRUCTION

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### Abstract

*Objectiv.* The aim of this study is to provide a theoretical, conceptual and practical analysis, regarding speed as a motor skill for visually impaired pupils.

*Methods.* In this study we used as method the differentiated instruction. Through the use of differentiated instruction in physical education lesson for students with visual impairments, we intend to demonstrate if progress can be made in terms of speed development. The study addresses to visually impaired subjects, enrolled in special schools, among which we find both blind and visual impairment pupils. The classes we refer to are part of secondary school, a 7<sup>th</sup> grade and 8<sup>th</sup> grades. An initial testing was conducted, which targeted reaction speed assessment, repetition speed of arms, and running speed. For speed's first form of manifestation we used the stopwatch test, for repetition speed we used Plate Tapping from Eurofit Battery of assessments, and for running speed we used 5 X 5 Shuttle Run Test from the National School System of Evaluation in Physical Education and Sport.

*Results.* After applying the assessments evaluation, value I and II groups were established for each grade involved in the experiment. After completing the instruction program, the pupils were again evaluated, using the tests from the initial testing.

*Conclusions.* The analysis of the results showed an improvement in terms of speed for the visually impaired pupils, using the differentiated instruction.

*Key Words:* blind, visual impairment, physical education lessons, speed, differentiated instruction.

### Introduction

In physical activities area, motility of people with disabilities has become a topic of interest to specialists. In this regard, more and more specialists have begun to approach and achieve researches which highlights aspects of instruction, evaluation, education, and by that forming a new discipline to study all this aspects- adapted physical education. Adapted physical education is viewed as a subdiscipline of physical education that provide safe, personally satisfying, and successful experiences for students of varying abilities (Winnick, 2010). Therefore, the formative process must be adapted to the specific particularities of people with special needs. In this regard, it is known that people suffering blindness and amblyopia are facing different problems from one to another, but also comparing to healthy people. In terms of motility, things are identical, meaning that available data indicate that the physical fitness performance of visually handicapped youngsters decreases as the severity of visual

impairment increases (Buell, 1966, Winnick and Short, 1982 quoted by Winnick, 1985, p. 292).

Hippocrates, the father of medicine said hundreds of years ago that activity strengthens – inactivity weakens. Knowing this, we can conclude that visually impaired pupils should participate in physical activities to improve their fitness level, maintain and improve health, develop harmoniously their body, keep the psychological tone at a good level and develop the communication skills

Across almost components of physical fitness, subjects with visual impairments have significantly lower scores than subjects without impairments (Buell, 1950; Jankowski & Evans, 1981; Kobberling, Jankowski & Leger, 1989; Kobberling, Jankowski & Leger, 1991; Seelye, 1983; Sephard, Ward, Natale & Lee, 1985; Short & Winnick, 1986 quoted by Skaggs & Hopper, 1996). The only exception was that skinfold scores of male with blindness were not significantly different from those of males with nonimpaired vision (Kobberling et al, 1989; Short

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& Winnick, 1986 quoted by Skaggs & Hopper, 1996).

In terms of psychological characteristics, adolescents with visual impairment less often had many friends and dates with other young people than those without visual impairment. They also reported more often feelings of loneliness and difficulties in making friends. However, some adolescents with visual impairment, especially girls, need more support in their psychosocial development (Huurre, Aro, 1998).

Many aspects of the learning process can be modified to enhance instruction (Tomlinson, McTighe, 2006 quoted by Winnick, 2010). As a result of the desire to increase the efficiency of the physical education lessons of visually impaired pupils, we will use as method the differentiated instruction.

The problem for the school, as it relates to these special classes of children, we have found, is one of diagnosis, proper classification, curriculum adjustment, restatement of educational objectives, revision of teaching methods, differentiated instruction, and proper training and habit formation, with a view to the removal, in so far as is possible, of the social menace of those children who enter school life in a handicapped physical or mental condition (Wallace, APA). Addressing to visually impaired pupils, we will approach the method in accordance with the different diseases (blindness and amyopia). We use the method because not all pupils are alike. Differentiated instruction is a process to approach teaching and learning for students of differing abilities in the same class (Differentiated instruction). In physical education, differentiated instruction appeals to organisation and conducting the activity divided in values groups, differentiated by the criterion of biological and motoric potential. The groups are constituted following the evaluation from the beginning of the instruction period (Șerbănoiu, Tudor, 2007).

Applying this method in physical education, will lead to a better efficiency of the process, by giving subjects the possibility to act according to their particularities. In the case of speed, defined as the capacity starting from neuromuscular processes mobility and muscular capacity to develop a strength, and to realize motor actions in the minimum time (Manno quoted by Tudor, 1999).

Visually impaired pupils need special attention, compared to pupils who are not characterized by such a condition.

## Methods

This experimental research regarding speed development for the students with ophthalmic deficiency using differentiated instruction, was realized during 2014 – 2015 scholar year, and has targeted the following stages: applying the initial evaluation, establishing the experimental and control groups, dividing the pupils from the experimental groups into value groups, conducting the differentiated activity depending on the value groups and applying the final assessments for evaluating speed.

The aim of the research

The aim of this study is to streamline the physical education lessons addressed to manifestation forms of speed, as reaction speed, repetition speed or running speed, for 7<sup>th</sup> grade and 8<sup>th</sup> grade, containing visually impaired pupils.

Hypothesis

In physical education's lessons, the use of differentiated instruction according to the motor potential and the ophthalmic deficiency of the pupils suffering of visual impairment and blindness from the 7<sup>th</sup> and 8<sup>th</sup> grades, will determine an improvement of the performances of these pupils, in matters of the three manifestation forms of speed.

Participants and venue

The subjects involved in this study are pupils with visual impairments from the gymnasium, respectively in the 7<sup>th</sup> and 8<sup>th</sup> grades from Gymnasium Special School from Bucharest.

For each year of study were chosen two classes: A and B. Classes noted with A are the experimental groups, while the classes noted with B are the control groups. In this research, the two classes noted with A (7<sup>th</sup> and 8<sup>th</sup>) represented the experimental group, and the two classes noted with B (7<sup>th</sup> and 8<sup>th</sup>) were accounted as the control group. The study included 30 pupils who have been assigned as follows: 7<sup>th</sup> A: 4 boys and 3 girls; 7<sup>th</sup> B: 3 boys and 4 girls; 8<sup>th</sup> A: 2 boys and 7 girls; 8<sup>th</sup> B: 4 boys and 3 girls.

The subjects included in the research has both amblyopia and blindness. Ophthalmic diseases most commonly found are represented by: myopia, retinal detachment, nystagmus, strabismus, hyperopia, cataracts, optic atrophy.

From the associated diseases met in the experimental group, and in the control group, we remind: attention deficit hyperactivity disorder, mental retardation, congenital heart disease, epilepsy, hypomnesia, allergic asthma. We mention that there are cases of subjects that don't present such an associated pathology.

Tests used in the research

The initial and final assessments used in this study are represented by Plate Tapping, Stopwatch Sample and 5 X 5 Shuttle Run Test. We mention that these tests were applied to all three experimental classes.

Plate tapping has been applied in accordance with the original sample of Eurofit Battery, but with certain requirements to the particularities of visually impaired pupils, respectively for pupils suffering of amblyopia, the plates will have a stronger color, which will allow a faster identification, and the pupils suffering of blindness will be allowed a longer period of practice before running the test, in order to have a better representation of the distance between the plates.

Stopwatch sample means starting and stopping as fast as possible the stopwatch, using the thumb, for both hands. The assessment does not require adaptation for visually impaired pupils.

The 5 X 5 Shuttle Run test (National Scholar System of Evaluation in Physical Education and

Sports, from Romania) will be adapted, in terms of a strict delimitation of the distance with more bulky and colorful objects, either pupils with bell rings, for a better spatial orientation of the subjects with blindness.

Blind pupils will benefit from assistance from the teacher or other colleagues with remnants of light, meaning that they will be lead in advance each time in order to improve the topographical representation.

The content of research

During the lessons, the experimental classes have worked on value groups, resulted from the initial assessments, in accordance with the motor potential and the ophthalmic deficiency of the pupils. Value groups had a closed character, which didn't allow to the pupils to migrate from one group to another, while running the instruction program. The division into value groups was made according to the obtained performances and in accordance with a scale of assessment (Table 1), conducted at the unit level of education:

Table 1 . Scale of assessments 7<sup>th</sup> and 8<sup>th</sup> grades:

Speed	Points and range of values										
	1	2	3	4	5	6	7	8	9	10	
Plate Tapping (seconds)	>26- 26.99	25- 25.99	24- 24.99	23- 23.99	22- 22.99	21- 21.99	20- 20.99	19- 19.99	18- 18.99	<17- 17.99	
Stopwatch (hundred of seconds)	Right	>32	31	30	29	28	27	26	25	24	<23
	Left	>32	31	30	29	28	27	26	25	24	<23
5 X 5 Shuttle Run (seconds)	>17- 17.99	16- 16.99	15- 15.99	14- 14.99	13- 13.99	12- 12.99	11- 11.99	<10- 10.99	9- 9.99	<8- 8.99	

According to the scales, the performances were converted into points, which had determined the value group in which each pupil of the experimental group was a part. The split was possible after calculating the mean of the points obtained for speed: value group I (40-21) and value group II (20-0). Inside of the physical education lessons, different measures have been taken regarding the instruction and education process. In this matter, we refer to the two parameters of the effort: size and orientation. According to them, the tasks pupils have to perform differs from one value group to another:

- Value group I – characterized by the increase of the intensity of the effort, by conducting various exercises structures, by decreasing the volume of the effort;

- Value group II – characterized by the decrease of the intensity of the effort, by conducting standard exercises, by decomposition of some movements.

We mention that the control group didn't benefit of the differentiated instruction. The activity was not carried out on the value groups. The control group followed the training program met in the traditional physical education lessons.

## Results

Recorded data for the initial and final assessment allowed us to perform an analysis of the number of subjects, in accordance of the value group from which they are a part, as follows (Table 2):

Table 2. Repartition of the experimental group into value group:

Grade	Initial assessment		Final assessment	
	Value group I	Value group II	Value group I	Value group II
7 <sup>th</sup> A	2	5	6	1
8 <sup>th</sup> A	5	3	7	1

Comparing the initial and final assessments of experimental groups we concluded the following:

7<sup>th</sup> A:

- Stopwatch test Right thumb: the groups mean is 28.14 hundred of seconds, moderate scattering (28.67%) at initial assessment, 23 hundred of seconds and moderate scattering (20.23%) at final assessment. We can observe an improvement in favor of final assessment by 5.14 hundred of seconds.
- Stopwatch test Left thumb: the groups mean is 32.42 hundred of seconds, moderate scattering (38.30%) at initial assessment, 23.14 hundred of seconds at final assessment. We notice an improvement equal with 9.28 hundred of seconds.
- Plate tapping : mean is 25.76 seconds, standard deviation 5.07 and moderate scattering (19.70%) at initial assessment and 21.44 seconds at final assessment. The values achieved at the final assessment are better than the ones achieved at the initial assessment, the performance was improved with 4.32 seconds.
- 5 x 5 Shuttle Run Test: the group mean is 15.99 seconds at initial assessment and 14.40 seconds at final assessment. We can observe an improvement of 1.59 seconds in favor of final assessment.

8<sup>th</sup> A:

- Stopwatch test Right thumb: the groups mean is 39.87 hundred of seconds, excessive

scattering (28.67%) at initial assessment, 24.25 hundred of seconds and moderate scattering (23.09%) at final assessment. We can observe an improvement in favor of final assessment by 15.53 hundred of seconds.

- Stopwatch test Left thumb: the groups mean is 34.37 hundred of seconds, excessive scattering (55.23%) at initial assessment, 24 hundred of seconds at final assessment. We notice an improvement equal with 10.37 hundred of seconds.
- Plate tapping : mean is 21.28 seconds, standard deviation 6.17 and moderate scattering (28.99%) at initial assessment and 18.58 seconds at final assessment. The values achieved at the final assessment are better than the ones achieved at the initial assessment, the performance was improved with 2.7 seconds.
- 5 x 5 Shuttle Run Test: the group mean is 13.62 seconds at initial assessment and 11.93 seconds at final assessment. We can observe an improvement of 1.69 seconds in favor of final assessment.

Comparing the final assessments of experimental groups and control group we can establish that the performances of first group are better than the control group (Fig. 1 and Fig. 2)

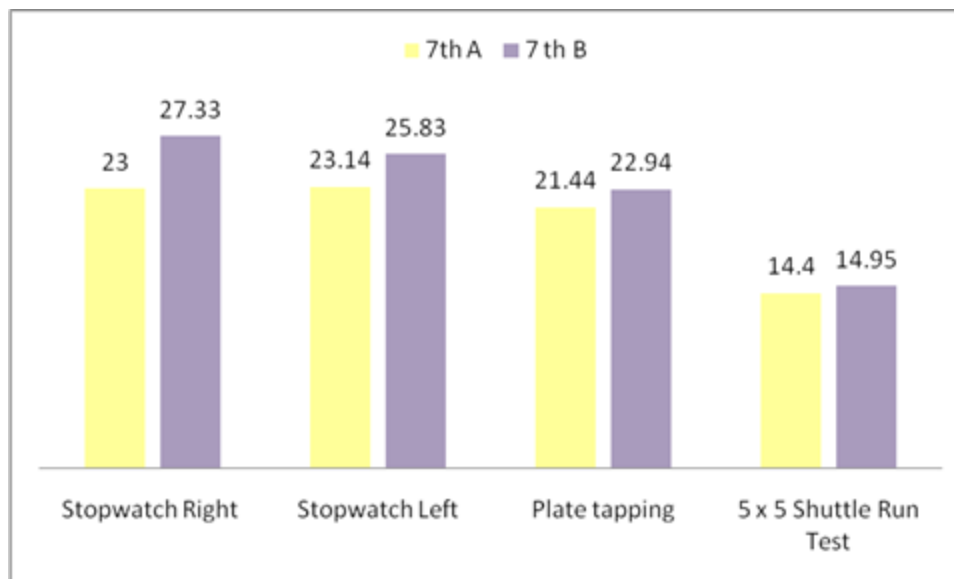


Figure 1. The means of experimental and control group (7th grade) at final testing

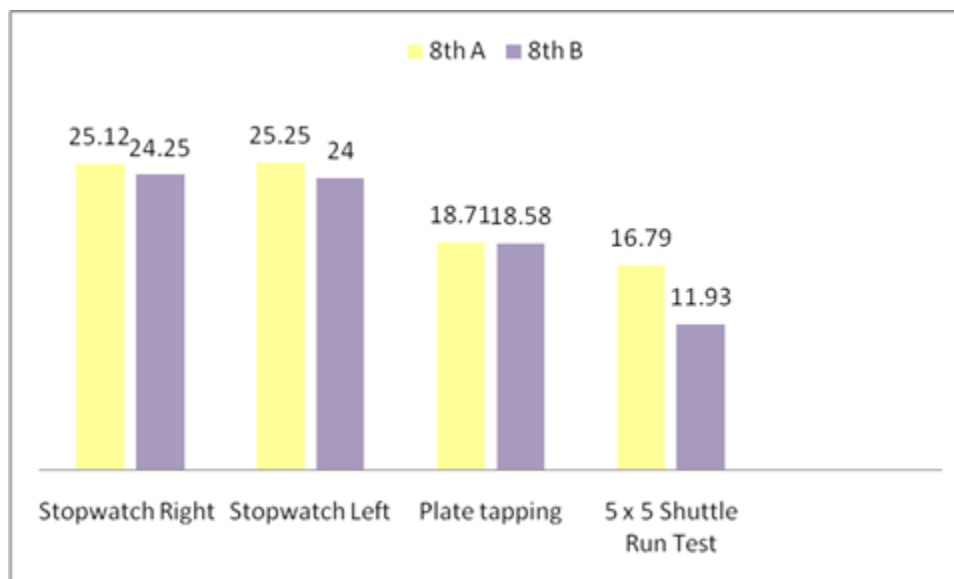


Figure 2. The means of experimental and control group (8th grade) at final testing

### Discussion

In physical education lessons from gymnasium it can be noticed an improvement of the performances obtained at the final testing, of visually impaired pupils, in terms of speed, by using the differentiated instruction.

For applying the differentiated instruction, it is necessary that the persons in charge with conducting

the lessons must know aspects regarding individual particularities of each subject (motoric, functional, morphological and psychological).

Analyzing the charts showing the performances reached by the four groups of pupils of this research, we can conclude that the experimental groups (7<sup>th</sup> A and 8<sup>th</sup> A) have achieved better results, comparing to the control groups.



We mention that we didn't apply the differentiated instruction for the two control groups, who had followed the frontal instruction usually used in physical education lessons.

During the research, but also analysing the individual results obtained by visually impaired pupils, we have noticed that some pupils have had difficulties in doing the motor activities required .

In the physical educational process, it should be taken into consideration an appropriate dosing of effort, and this matter requires a special attention due to individual particularities of visually impaired pupils.

Applying the evaluation tests requires adaptability, because pupils from our research are characterized by the absence of the visual analyzer, or there is an affected visual analyzer.

It is recommended that during the warm up, the exercises used must be done in accordance with maintaining and improving of body posture.

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- Wallace, APA <http://psycnet.apa.org/books/12231/>