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# Improvement of Motor Performance of Students with Mentally Retardation

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**Abstract**

Education for all is a basic tenet of our democratic faith, and the opportunity for each individual to develop optimum potential is a guiding principle of our educational system. The specialists in physical education and sport should be convinced that the whole spectrum of sportive activities can be practiced by the individuals with special needs if the teachers, parents and other people understand these disadvantages as, ability" and not as a problem. Gross motor skills and continuous tasks have been found to be retained longer and more effectively when they are associated with different knowledge (distance, spaces, time, softness, hardness, rhythm,) and other movements. The present study is focused on 24th students in special school. They were diagnosed with mentally retardation- Mild psychic retard-an IQ among 45-65; they are all educable. Each exercise has an aims, and also an intellectually task. We were appreciating motor performances as: speed running, endurance, arms and abdominal force, ball throw, and standing long jump. The hypothesis was confirmed, which meant that manipulative exercises accompanied with intellectually task increases the efficiency of physical education lessons to students with mental retardation. It emphasizes the significant progress of the experimental group compared to the control group on all indicators of motor performance. The exercises were attractive and stimulated a spirit of emulation.

**Key words:** Motor performance, Mentally retardation, Exercise, Student.

## INTRODUCTION

The efforts of improving the lives of young people with disabilities require special attention from the part of many specialists in many fields and among these are those in the physical education field. It is very important to believe that the acquisitions at this level can be achieved by working with children, students with a low level of functioning. In this way, we emphasize the idea according to which the abilities and not disabilities count. All the specialists involved should be convinced that the saying „nothing is impossible" applied to the individuals with special needs will solve their integration and acceptance in the society (Dunn et al.1989, Eichstaedt and Lavay 1992, Fait and Dunn 1984). The whole spectrum of sportive activities can be practiced by the individuals with special needs if the teachers, parents and other people understand these disadvantages as, ability" and not as a problem.

*The concept of mentally retarded in general idea.* The mentally retarded is a concept. The lack of terms which define the mentally retarded individuals resulted in the considerable confusions created along the time and in the attempts of analyzing this illness. In 1959, American Association of Mental Deficiency (AAMD) elaborates a definition of the mentally retarded concept which is improved in 1973 and which specifies the fact that: mentally retarded concept refers to the under-average intellectual functioning with problems of behavioral adjustment which appears in the developing period". In this way it was established that those who prior to 16 years old have more than one deviation under the mean of the score established by the intelligence normalized test and have a weak behavioral adjustment, are classified as mentally retarded. In most intelligence tests the mean is of 100 points and the standard deviation is from 15 to 16 points. This means that those who have a score lower than 85 at the intelligence tests are mentally retarded. At the same time those who have a score between 70 and 85 are classified as being at the edge of the mentally retarded area. In 1973, AAMD redefined the mentally retarded concept and included the individuals who prior the age of 18 have one or two standard deviations under the mean. This lowers the test under the limit of 70. The individuals who have one or two deviations under the below limit are re-classified. In 1983, AAMD further clarified the superior score of the IQ, and for diagnosis there was a guide, and with a clinic judgment the score could be extended to 75. (Krebs 1995). In 1992, a new definition was adopted: the mentally retarded concept refers to the substantial limitation of the present functioning. It is characterized by an intellectual functioning significant under average which exists at the same time with limitations in two or more abilities: communication, self-care, the capacity of living on their own, sociability, health and safety, using social utilities, self direction, academicals functioning, work and relaxation **(**Dobins et al. 1981). Therefore, we should encounter three criteria in an individual in order to label him as mentally

retarded: To achieve a score lower than 70-75 at the intelligence test. Two intelligence tests are mainly worldwide used: Stanford-Binet Intelligence Scale and Wechesler Intelligence Scale for Children Revised – WISC –R. The significant limitations should exist in two or more than 10 adapted skills where the individual's maturity and his ability to adjust are measured. The mentally retarded person reveals himself before the age of 18. As classification, there are many classification systems of the mentally retarded: behavioral, an etiological and educational.

**Table 1.** Until 1992 the intelligence tests have also determined the severe level of the mentally retarded as we can see in the table (Krebs 1995).

| The intelligence test score | The level of the mentally retarded |
|---|---|
| 50-55 to 70-75 | Low |
| 35-40 to 50-55 | Moderate |
| 20-25 to 35-40 | Severe |
| Lower than 20-25 | Profound |

The terms of mental deficit, mentally retarded, mental handicap, mentally disabled are used to designate the fact that an individual is incapable of acquiring a normal mental development. This kind of individual is incapable of an adjusting behavior and has an intelligence coefficient under 70.

**Table 2.** After 1992 the intelligence tests have established the following scores and modifiers

| Classification | Stanford-Binet | Wechsler |
|---|---|---|
| Low | 68-52 | 69-55 |
| Moderate | 51-36 | 54-40 |
| Severe | 35-20 | 39-25 |
| Profound | 19 and lower | 24 and lower |

**Table 3.** The teachers classify the mentally retarded in three groups

| Classification | IQ |
|---|---|
| Educable | 75-50 |
| Trainable | 49-30 |
| Severe and Profound | 29 and lower |

*Classification – severe and profound*. The severe and profound mentally retarded individuals are usually identified at birth or short after that. Their condition is attributed to the defects in their central nervous system. The severity of their mental retard implies the education of some abilities regarding dressing-up, eating, drinking and going to the toilet. Also, we should take into consideration educating the language and communication. An individual with severe and profound mental retard should be taken care of and supervised all his life. Recently, the development of instructional and educational strategies has recorded improvements in the adjusting capacities of this category. The movements they can perform definitely depend on the mental abilities, the lack or existence of psychic handicap, the general level of comfort and on the previous experience in physical education (Ulrich 1984).

*Classification – moderate (trainable)*. The individuals who have some potential in looking after themselves, for their special needs, for socializing, for using economic facilities, are classified as moderately retarded. The individuals in this category can acquire abilities of self-attendance and can get a degree of independence. These are capable of learning to live in a family, to make and maintain friends and to interact with others. Their mental development is almost ¼ or ½ as that of a child, and, therefore, the majority can be trained to learn a certain amount of motric skills, to write, basic concepts of numbers and basic, simple language.

*Classification – easy (educable)*. The individuals who encounter difficulties in learning but are capable of learning basic school abilities are classified as easily mentally retarded. In general, they are capable of acquiring from the II-nd grade up to the VI-th grade, writing, reading and calculating abilities. Their development is approximately ½ up to ¾ from a normal child development (Gallahue 1996). The most students are capable of learning together with the normal children and of acquiring enough abilities in order to take care of themselves when they become mature, economically speaking. In this way, their acquisitions give them the possibility of ensuring a personal attendance, so when they leave school they are not considered mentally retarded anymore.

## MATERIAL and METHOD

The hypothesis of this study. Applying exercises and games with different tasks, adjusted for mentally retarded children will lead to the increase of acquisitions physically and intellectually. 12 subjects with an average age of =14,6±0,98 years represented the experiment group. The control group was formed of 12 subjects with an average age of 14,4±0,78 years.

The study was performed on a 6-month period, two lessons per week which sumed 62 hours. The tests aimed the identification of the personal IQ, the physical development and that of the psycho-physic capacity.

**Table 4.** Data summary for the experimental group

| Nr. crt | Diagnosis | Nr.crt. | Diagnosis |
|---|---|---|---|
| 1. | Psychic moderate retard IQ = 49 | 7. | Mild psychic retard IQ = 60 |
| 2. | Mild psychic retard IQ = 52 | 8. | Mild/moderate psychic retard IQ = 49 |
| 3. | Mild psychic retard IQ = 58 | 9. | Mild/moderate psychic retard IQ = 49 |
| 4. | Mild psychic retard IQ = 55 | 10. | Mild/moderate psychic retard IQ = 49 |
| 5. | Mild/moderate psychic retard IQ = 50 | 11. | Mild psychic retard IQ = 51 |
| *6.* | Mild/moderate psychic retard IQ = 49 | 12. | Mild psychic retard IQ = 56 |

**Table 5.** Data summary for the control group

| Nr. crt. | Diagnosis | Nr. crt. | Diagnosis |
|---|---|---|---|
| 1. | Mild mental retardation IQ = 58 | 7. | Mild psychic retard IQ = 65 |
| 2. | Mild psychic retard IQ = 55 | 8. | Mild psychic retard IQ = 60 |
| 3. | Mild psychic retard IQ = 65 | 9. | Moderate psychic retard IQ = 48 |
| 4. | Moderate psychic retard IQ = 47 | 10. | Moderate psychic retard IQ = 45 |
| 5. | Moderate psychic retard IQ = 49 | 11. | Mild psychic retard IQ = 64 |
| 6. | Moderate psychic retard IQ = 46 | 12. | Mild psychic retard IQ = 57 |

We applied some manipulative exercises with balls. Each exercise has been fitted with a theme. Subjects taught manipulative exercises with elements of space, time, distance, tempo, rhythm, knowledge about the human body, hardness and softness, different size of balls, terrain, walls. Examples of activities with the balls: 1. In a wide straddle position place the ball on the floor, and roll it with constant finger guidance between and around the legs. 2. Roll the ball in a figure-eight path in and out of legs. 3. Turn in place and roll around with one hand in a large circle. 4. Roll the ball around while lying on top of it. Roll the ball around the floor while on all fours, guiding it with the nose and forehead. 5. Bounce with two hands, bounce and catch the ball. 6. Bounce at different levels. 7. Bounce, perform various stunts (heel click, body turn, or handclap), and catch. 8. Bounce the ball around, under, and over the body. 9. Practice various kinds of bounces, catching all with the eyes closed. Bounce the ball using consecutive body parts (head, elbow, and knee). 10. Bounce the ball slowly, hard, with speed, forward, backward, sideward, high, and low. 11. Toss and catch, increasing gradually. 12. Toss upward and catch the descending ball to self from various directions. 13. From seated position, toss the ball to self from various directions. Lie down and do the same. 14. Bat the ball as in volleyball by using the fist, an open hand, or the side of the hand. 15. Bat and let the ball bounce. Catch in different fashions. 16. Bat and rebound the ball so that it does not touch the ground. Change the position while doing this. 17. Dribble the ball first with both hands and then with the right and the left.18. Dribble the ball at different levels

and at various tempos. 19. dribble without looking at the ball. 20. Throw the ball against the wall, and catch the return after one bounce. Practice various kinds of throws: two-handed, one –handed, overhead, side, baseball, chest pass. 21. Throw at a target mounted on the wall. 22. Throw against a wall and catch on the fly. 22. Drop the ball and bat it after it bounces. Keeps the ball going as in handball. 23. Serve the ball against the wall as in volleyball. 24. Practice different ways to control kicking against the wall and stopping the ball on the return. Try using the foot to keep returning the ball against the wall on the bounce.25. put some targets on the wall and kick the ball at a target (Pangrazi and Dauer 1992).

**Statistical Analysis**

The SPSS statistical program (version 13.0) was used for data analysis. Standard statistical methods were used for the calculation of means and SD. The Kolmogorov-Smirnov test was used to determine if dependent variables were normally distributed. The Levene test was used to determine if there was homogeneity of variance. Unpaired t-tests were used to determine significant differences over time for each independent variable. For all analyses, the criterion for significance was set at an alpha level of $p < 0.05$.

**RESULTS AND DISCUSSION**

The comparative analysis of recorded data for the motoric capacity indexes between the experiment group and the control group in pre- and posttest (Table 6).

**25 m. speed running.** In pretest the group of values calculated for the speed running event on 25m for the two groups in our study highlights that there are no significant differences between the two samples, and the homogenity is included within average limits. In posttest, the parameters recorded in the speed running event on 25m present a progress especially in the experiment group where speed improves with 0,22 sec., and in witness group with 0,05 sec. The difference between groups, although both progress, is statistically significant, in favour of the experiment group, at the signification limit of $p<0,05$.

**Endurance.** The data recorded for resistance running in pre-test highlight the fact that there are no significant differences between the two groups, a fact which leads to the idea that these are equal in this experiment. In posttest, in resistance running, a significant difference is observed in favour of the experiment group compared to the control group, at the signification limit of $p<0,025$.

**Table 6.** The comparison of the motoric capacity indexes between the experiment group and the control group in pre- and posttest

| Dependent Variables | Independent Variables | N | Pretest | t | Posttest | t |
|---|---|---|---|---|---|---|
| **25m Speed running** | Experimental group | 12 | 5,41±0,56 | 0,537 | 5,19±0,66 | 1,782* |
| | Control group | 12 | 5,50± 0,65 | | 5,45±0,83 | |
| **800m Resistance running** | Experimental group | 12 | 4,37±0,39 | 0,464 | 4,22±0,69 | 2,365* |
| | Control group | 12 | 4,38±0,53 | | 4,30±0,98 | |
| **Standing long jump** | Experimental group | 12 | 138,75±2,13 | 2,191* | 144,58±0,76 | 3,457* |
| | Control group | 12 | 136,75±4,20 | | 138,91±2,47 | |
| **Tennis ball throw** | Experimental group | 12 | 17,83±5,56 | 1,242 | 20,16±1,65 | 1,728* |
| | Control group | 12 | 18,25±7,97 | | 20,08±3,42 | |
| **Push-ups** | Experimental group | 12 | 7,08±5,44 | 0,261 | 8,83±1,06 | 2,932* |
| | Control group | 12 | 6,83±6,98 | | 7,91±0,19 | |
| **Sit up test** | Experimental group | 12 | 18,75±0,82 | 2,574* | 21,66 ±1,24 | 3,242* |
| | Control group | 12 | 18,83±0,64 | | 20,41±2,35 | |

*P<0,05

We believe that the records made by our subjects with mental retardation are very good if we take account of data recorded from normal children, that is 4.06 s (Nicu,A.et all, 1980). Both groups progress at this level too, although children are mentally retarded and the recorded times are considerable as performance.

**Standing Long Jump.** In pre-test, we notice that both groups have values whose dispersion is relative, the data oscilate between 85cm., the smallest value in the control group and 170cm., and in the experiment group 105cm. and 175cm. The difference between the means of the two groups is statistically significant at $p<0,025$. Regarding the variability coefficient, this fits within the homogenity limits. In posttest, at long jump standing, we observe a real progress in the experiment group compared to the control group, the most edifying thing is the t-Student test and the signification limit of $p<0.005$. Nicu, A.et all, 1980, in normal subjects find a 179cm average and if we compared to our subjects that record $144.58 \pm 0.76$ we appreciate the difference between them is considerable.

**The tennis ball throwing** at a distance event emphasizes that the means are close as values and thus, in pre-test we take into consideration that the two groups do not significantly difference and the individual values dispersion is higher and has a total lack of homogenity. In this event posttest, the subjects of our experiment, both the experiment and the control groups do not have big differences between means (0,42cm) and statistically speaking, the differences are significant, in favour of the experiment group, at a signification limit of $p<0,05$. Also, the variability coefficient represents a relative homogenity in both groups, and it integrates in values of 8,18% and 17,03%. The differnces beetwen the normal and mental retardation groups are bigger. For normal students the average is 38,2m., and for our experimental group is 20,17 at the posttest (Nicu,A.et all, 1980).

**Push-ups.** In pre-test we notice that the subjects of the two groups do not present statistically significant differences, which leads to the conclusion that at the beginning of the experiment they are all equal, and the fact that dispersion is higher highlights a great scattering of the data which present values of 4 push-ups and 10 push-ups, and the variability coefficient shows a lack of homogenity. In posttest, we observe that both groups progress regarding the force of the upper limbs, but the difference between means is statistically significant at the signification limit of $p<0,005$.The variability coefficient integrates within average and good limits for both groups, so we notice a relative and very good homogenity.

**Sit up test.** As we notice, in the two tests, the groups present close indexes of the abdominal force and, although in pre-test the control group is superior as mean, the experiment group finally overcomes it and the progress is significant and the difference between the two groups means is statistically significant at $p< 0,005$, in favour of that the independent variable was applied on. We consider the performances recorded by our subjects with mental retardation are very good very close to the recorded performance of normal subjects. (The Euro fit Physical Fitness Test Battery, 1988). The variability coefficient finally has better indexes in the experiment group, this emphasizing a good homogenity compared to the control group which has a relative homogenity.

**Conclusions.** The hypothesis was confirmed, which meant that manipulative exercises accompanied with intellectually task increases the efficiency of physical education lessons to students with mental retardation.

It emphasizes the significant progress of the experimental group compared to the control group on

all indicators of motor performance. The exercises were attractive and stimulated a spirit of emulation.

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