Informational technology in measuring motor characteristics elementary school pupils

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Abstract:
This paper deals with software for measuring pupil’s abilities in elementary school. To assess the physical abilities of students we used the battery of tests "Eurofit. Tests are carried out in certain order: taping hand - segmentary speed, reach the sedu - flexibility, jump from a place - the power leg, jump in - static force, running 10 times 5 m - agility, running 20 m - sprint speed, coordination with bat - coordination, endurance running in (progressively increasing the load) - endurance. Sample includes 1002 students. Based on the results and comparisons with available standards of other authors, we can say that the level of development of motor abilities of students from IV to VII grade school, in most cases within the norms for their age..

Key-Words: Informational technology, WEB resources, Motor characteristics, Physical education, Sport-technical education

1. Introduction

Physical education, gives the importance of the overall development of personality, a very significant factor in educational work in primary school. The program is envisaged that the development of physical skills for each class in physical education in all grades. Particular attention has been given to developing the basic elements of physical fitness and strengthening of normal natural body posture at rest and movement. We made a WEB portal with didactical materials for planning, realization and evaluation the effect of physical education and a software for measuring pupil’s abilities. [4].
2. Methodological bases of research

Subject of research is the examination of motor characteristics of students. The aim is to examine the motor characteristics of students from IV to VII grade school. The main task of this research is to determine the level of physical abilities of students from IV to VII grade school. The general hypothesis by which jobs in this research is that the level of development of physical abilities of students from IV to VII grade elementary school located within the boundaries (norms) for this age group. In this study, were used servej research methods and theoretical analysis methods and techniques as were used scaling techniques and statistical techniques of processing the collected data. Statistical processing of results, performed on a PC, using the statistical package "SPSS". Our software included tests of physical abilities, as well as tabular and graphical presentation of research results. As an indicator of physical assessment skills of students measured the following variables concerning the status of students motor abilities (taping hand, reach the, jump from place to jump, running 10 times 5 m, 20 m running, coordination with the bat, the endurance run (progressively increasing the load). Sample includes 1002 students - students from IV to VII grade school [6].

3. Analysis and result interpretation

The test "taping hand" candidate was to dexterous hands 25 times touches two disk diameter 20 cm for the shorter time. It turns out that with the passage of time, i.e. with increasing chronological age, boys and girls achieve better results, i.e. to succeed in a shorter time to finish the task (chart 1). In the period from fourth to seventh grade and the boys and girls, a result of the test is improved by about 20%.

Graph 1. Student’s Hand-taping from grade IV to VII

The test "reach the sedu" candidate was to sit on the floor with outstretched legs, fingers, reach, reach out. Flexibility is a physical ability that refers to the execution of movement with the maximum possible amplitude. Mobility in the wrist depends on anatomic characteristics of joint in which movement is performed and the elastic properties of muscles, tendons and ligaments. The first characteristic is immutable, while the other may affect training. Good flexibility is required primarily for the quality performance elements of technique and reducing the risk of injury. Flexibility is greater in girls than in boys (Graph 2). Pliability of the boys from fourth to seventh grade, increased slightly, i.e. cm from 18,04 in the fourth, to 20.62 cm in the seventh grade. For girls, increased flexibility is somewhat higher, so the result of the test is improved from 20.24 cm in the fourth, to 25.94 cm in the seventh grade.

Graph 2. sedu reach the students of classes IV to VII
In the test, "jump from the place," a respondent has a duty to jump out. Boys in this test achieved better results than girls and the result improves with age pupils (Figure 3). Boys in fourth grade jump jumped slightly over 140 cm and 172.9 cm in the seventh, which represents progress for over 20%. Girls progress a little smaller, i.e. about 15%. While in the fourth jump in average jumped about 130 cm, in the seventh grade they achieved just over 150 cm.

Graph 3. Jump from the place of students' grade IV

In the test, "Hang in air" candidate, demonstrate static force, trying to hold the position as long as possible. Boys demonstrate larger static power than girls (Graph. 4). As a result of this test in the fourth grade, amounted to more than 20 seconds, the seventh amounted more than 32 seconds, which is a total improvement of about 60% of girls, the percentage increase is also approximately 60%, but in absolute amounts, the result increased from 12.65 seconds in the fourth to 19.3 seconds in the seventh grade.

Graph 4. Hang in air students from grade IV to VII

Agility was measured by the respondent had the task to run distance 5 meters, as quickly as possible, 10 times in a row. Boys and girls have improved the result of about 10% for the period from fourth to seventh grade (chart 5). Boys have achieved slightly better results, in the fourth grade of 23.42 seconds and 21.22 seconds in the seventh. Girls in fourth grade got the result of 24.51 seconds and 22.82 seconds in the seventh.

Graph 5. Run 10 times in 5 m students from grade IV to VII

Sprint speed was measured by the respondents were is required to run 20 meters. Girls in seventh grade, achieved the result that the boys scored in the fourth grade (Graph 6). Progress in results from fourth to seventh grade, was less than 10 percent both for boys and girls. Boys in fourth grade achieve the result of 4.09 seconds and 3.83 seconds in the seventh. Girls in fourth grade, achieved a result of 4.30 seconds and 4.08 seconds in the seventh.

Graph 6. Running in 20 m students from grade IV to VII

Durability is measured by the respondents requested that the section of 20 m run pace dictated that are continuously rising. When the respondent was no longer able to maintain a target running speed, the task is interrupted. Durability for the boys is increased from 2.74 min. in the fourth grade to 4.38 minutes in the seventh grade (Graph 7.). For girls the increase of endurance from fourth to sixth grade is from 2.29 to 3.20 minutes, and then in the seventh grade dropped slightly to 3.12 minutes.
The obtained data show that there are times when certain physical abilities are developing intensively. They are called sensitive periods. This is the age when most characteristic reaction of the organism to influences which promote the development of physical abilities and their performance. These periods are for each functional system is different, which means that you should work on their improvement at the same time and the youngest age. For example, the sensitive period for development of the power of 11 to 14 year. It is believed that at puberty and after puberty there is a rapid development of strength, because it increases testosterone levels in the blood (Lekic, 1997).

Before puberty, working with weights makes a big increase in power, and can affect the development of bones and joints, especially the spinal column. However, weeds (1996) states that the strength can be initiated from 8 to 9 years. It can be practiced with one-handed lifting, strictly taking into account the size of the load and individual abilities of children. Thus, children aged 10 to 11 years, can be practiced with a load that is 30% of their body weight, age 11 to 12 years with 50% and 12 to 13 years with 75% of body weight. With the age of 13 years, the maximum load can be applied once in two weeks. Great everyday importance is development of children's organism in the period before and during puberty. This period is characterized by individual variations, not only by the starting time of puberty, but the intensity of his flow of people who belong to one age group. Individual pace of sexual development in children born the same year, significantly affect the overall level of somatic development motor functions, as well as the nature of the adaptation of the cardiovascular system in normal muscle work. Therefore, in determining the size of the load is necessary to take into account the biological age.

4. Conclusion

WEB portal contain software for measuring the results of pupil's motor characteristics in the area of physical education. Results are rather expectable, but good for comparing with a various groups of pupils from other schools. The test "taping hand showed that with the passage of time, with increasing chronological age, boys and girls achieve better results. In the period from fourth to seventh grade, with boys and girls result of the test is improved about 20%. The test "reach the sedu showed the greater flexibility in girls than in boys. In the test, "long jump" from the place boys achieved better results than girls and the result improves with pupil's age. The fourth grade boys, jumped more than 140 cm and 172.9 cm in the seventh grade, which represents progress for over 20%. Girls progress is smaller, (about 15%). The test "hang in air" boys expressed greater statistical power than girls. For girls, the percentage increase about 60%, but in absolute amounts, the result increased from 12.65 seconds in the fourth, to 19.3 seconds in the seventh grade. The test "run 10 x 50 m" boys and girls have improved the result of about 10% for the period from fourth to seventh grade. In the run in 20 m improvement in the results for the period from fourth to seventh grade, was about ten percent both for boys and girls. In the test, "coordination with the police" and the boys and girls have improved the result about 20% from fourth to seventh grade, and the oscillations were observed in the sixth grade. Endurance running is in the boys increased from 2.74 minutes in the fourth, to 4.38 minutes in the seventh grade.

References:

[1] Bumbova, A; Gavendova, H; Oulehla, H.: What Can Multimedia Add to the Optimization of