

# Creating WEB based didactical resources for teachers in physical education

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## *Abstract:*

Creating adequate didactical resources and planning the student's activities for physical education classes is very important in modern schools. Students prefer playing computer games and there are not enough physical activities in their everyday lives. 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, Pphysical education, Sport-technical education*

## **1. Introduction**

Good work in physical education, which has adequate influence on the development of physical abilities and needs optimal sport-technical training students, certainly has an impact on the formation of positive attitude towards children and youth physical education. Well done physical education should result, not only the depth of interest for physical exercise, but also the formation of positive

attitude towards him. Formed positive attitudes toward physical education and exercise are one of the conditions that the individual begins training to deal with, on the basis of their own choice or in concert with others. Formed a positive attitude towards training is transferred to other entities which strengthens the position of physical education, that is, its social functions. In a word, the process of physical education is successful if it influenced the formation of positive personality

traits of students. Physical education and its influences can be seen as a complex system of relations, including relations of concrete values, which from him, physical education, stem. 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].

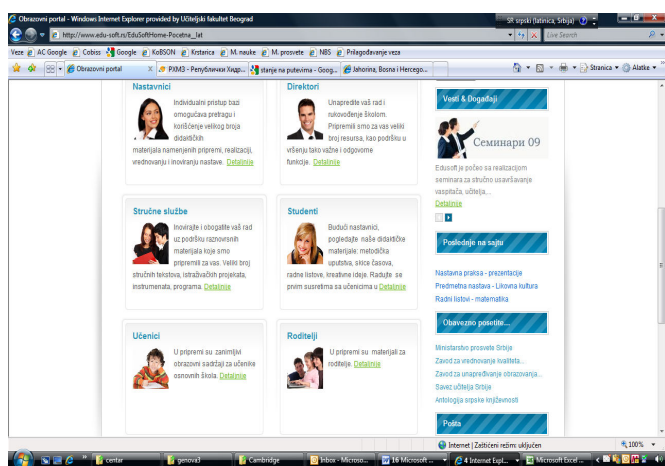


Fig 1. WEB portal for physical education

## 2. Adequate physical education

To give adequate physical education results and to meet the desired expectations, it is necessary to follow its reach and impact on the physical development of students, development of physical skills, sports and technical competence and psycho-social characteristics of personality of students. Evaluating the process of physical education and its results should be objective. It may be systematic, through continuous monitoring of physical development and physical abilities of students, objective assessment of movement learned envisaged program of physical education and selected parameters psycho-social characteristics. Also, the evaluation process in physical education

may be through scientific research in the field of physical education and their results. Such is the case with deepened research on the topic: "Achievements in teaching physical education, morphological, motor and psychological characteristics and personality traits of primary school students. Physical education, gives the importance of the overall development of personality, a very significant factor in educational work in primary school.

The program of physical education is defined by its objective, which refers to the satisfaction of student needs for mobility, increasing the contribution of adaptive and creative abilities in modern conditions of life and work, development of physical culture necessary for the preservation of health and create lasting habits of physical exercise to incorporate into everyday life and culture of living. The tasks of physical education related to exploring the significance and essence of physical education, the achievement harmonical physical development and proper body posture, development of hygienic habits, adopting a fund of motor knowledge, skills and habits, encourage and activate the latent abilities and talents for the remarkable versatile development and training in sport and dance. From the fourth to eighth grade physical education is conducted three times a week for one hour. For two hours the contents of a joint program implemented. The third class is implemented mandatory program selected one of the sports field. Alternately, the physical education program are focused in three directions:

- development of physical abilities,
- sports and technical education and
- correlation of physical education with life and work.



Fig 2. Exercises

The program is envisaged that the development of physical skills for each class 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. From fourth grade to introduce elements of athletics, exercise on the floor and apparatus, football (for students), rhythmic gymnastics and folk dancing (for girls), handball, swimming, basketball and volleyball. It is also used as extracurricular activities - hiking, cross, and winter camping. In the sports activities of students IV, V, VI, VII and VIII grade, includes the following sports fields and disciplines: athletics, exercise on the floor and apparatus, exercises on the loom, soccer, rhythmic gymnastics and dance, handball, swimming, basketball, wrestling and volleyball. Given that the content of physical education physical education provided for connection to the life and work, advise students to work independently on developing and maintaining physical fitness in everyday life.

### 3. 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].

### 4. 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%.

Taping hand – segmentary speed

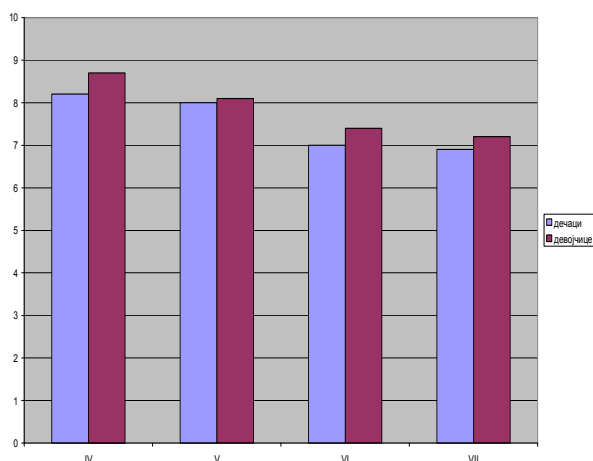
- Instruments: board on which are fixed two round plate diameter 20 cm, 80 cm distant to each other; stopwatch.



Fir. 3 Hand peed

- Assignment: The candidate less deftly placed his hand on center began, and deftly hand plate and crossed from the opposite side. The task is touching each circular plate 25 times.
- Evaluation: measure the time that the task performed with accuracy of 0.1 s. The measurement is performed twice, and processing is taken the better the result.

**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.



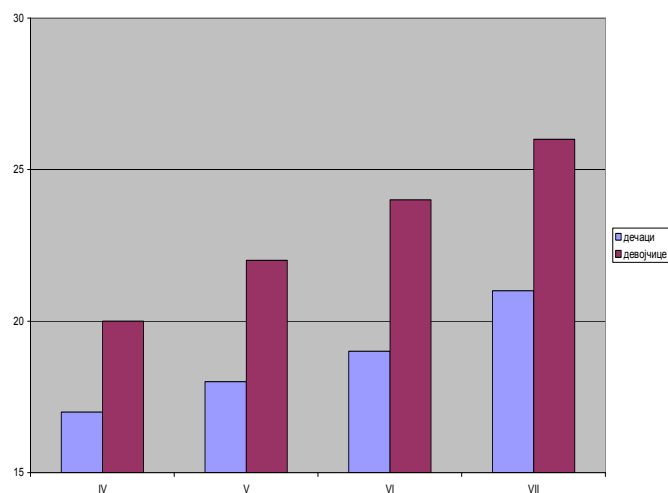
Fig. 4. Exercise

• Instruments: gymnastic bench, ruler, mat.

• Assignment: The candidate sits on the floor, while his feet (barefoot) is based on the gymnastic bench. Fingers trying to reach, get as far away mark on the ruler. The label is 20 cm in height feet.

• Evaluation: measure the length (in cm) reach the tips of fingers to reach

**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 .

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, ie. about 15%. While in the fourth jump in average jumped about 130 cm, in the seventh grade they achieved just over 150 cm.

• Instruments: measuring tape.

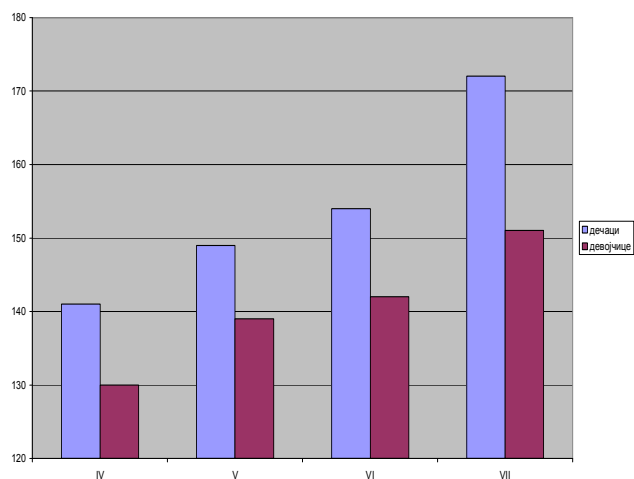
• Assignment: The candidate standing barefoot behind the line, the feet are hip width hands trying to jump out. Jumps twice. The account is taken the better the result.



Fig 5. Jump from the place

- Evaluation: measure the distance (in cm) from the line to the back foot print on the floor.

**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.

- Instruments: back, stopwatch.
- Task: Partner with respondent takes the position of the the shaft - the height beard back. Stopwatch

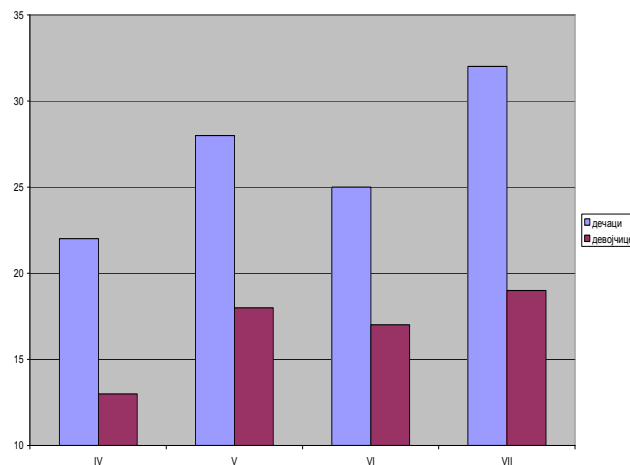
stops when I lay down arms so that the chin below the upper edge of the bars (rods).



Fig 6. Hanging in the air

- Evaluation: measure time in seconds (rounding down to 0.5; else up) for the respondent retains the position described. Measured time, eg., 15.8 s, the result of 158th

**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.

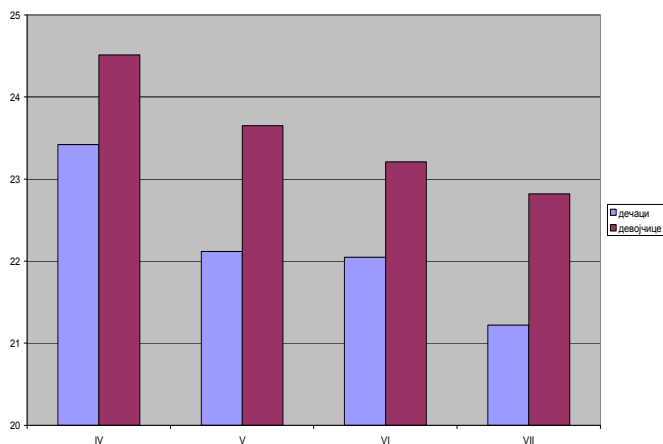
- Instruments: stopwatch.



Fig 7. Running 10 x 5 meters

- Assignment: The candidate running distance 5 m, as quickly as possible, 10 times in a row. Each time that both feet must cross the lines that indicate the target length.
- Rating: measured with accuracy of 0.1 s, the measured time, eg., 20.5 s, gives the result of 205<sup>th</sup>

**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

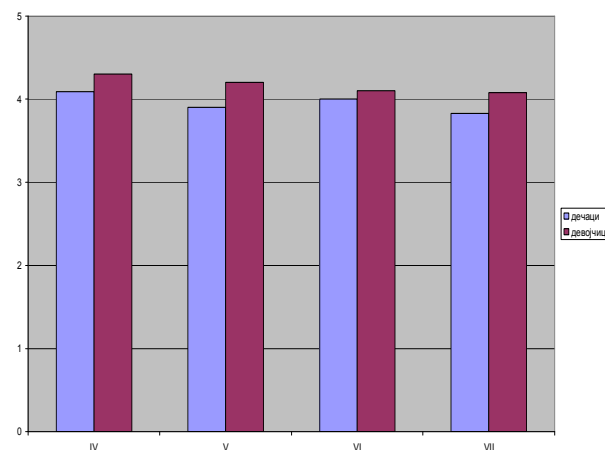
- Instruments: stopwatch, two stands, the course measuring 20 meters



Fig. 8. . Running in 20 m

- Assignment: The candidate begins to run from the first line, gradually accelerates and tries to 2 meters before the other lines to achieve maximum speed.
- Rating: measured with accuracy of 0.1 s, the time required to pass the candidate between the two stands.

**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.

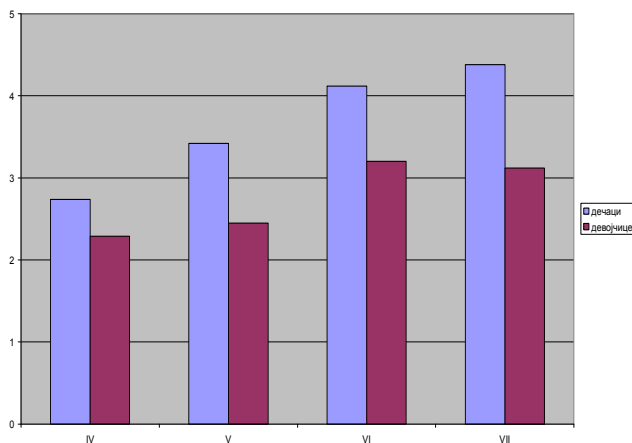
**Graph 7.** Durability of running students from grade IV to VII

- Instruments: stopwatch, two stands, the course measuring 20 meters



Fig. 9. . Durability of running

- Assignment: The candidate begins to run from the first line, gradually accelerates and tries to 2 meters before the other lines to achieve maximum speed.
- Rating: measured with accuracy of 0.1 s, the time required to pass the candidate between the two stands.



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 is period from 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.

**5. Informational technology in planning physical education**

There are a lot of problems in planning and realization of physical education. Teachers are not well prepared and students are not enough motivated for these classes. We made a WEB portal with didactical matherials for planning, realization and evaluation the effect of physical education. We describe the global plans, monthly plans and the student's activities for all classes. Description is combined with a pictures, movies, sounds and instructions. We planed integrative classes to combine content of musical and art education with sciences.

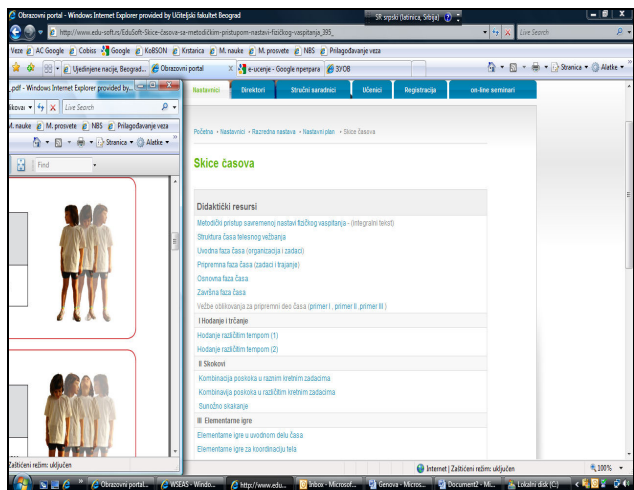


Fig 7. WEB portal for physical education

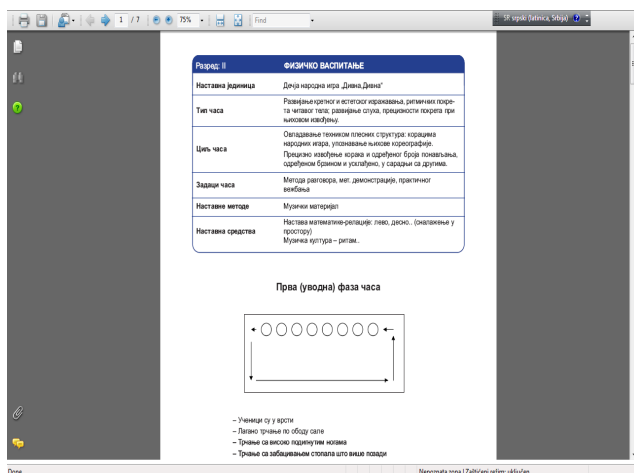


Fig 8. Instructions for teachers

Teachers can use plans, didactical materials, pictures, movies for all exercises according the program of physical education. These materials are located in WEB portal and could be saved on DVD, USB disk etc.

In last 10 years there are a lot of exercises located on DVD or CD-Rom and it was not so easy to reach them. That's why we created Data Base Management System for didactical materials based on PHP and Content Management System. It takes 5 years to develop enough materials for teachers and we are improving it everyday.

Firstly we have problems with teacher's ICT (Information Communication Technology) education, but due to several seminars and on-line materials for improving knowledge in this area we got teachers ready for using WEB resources.

Ministry of Education in Serbia is going to make standards for teacher's competencies and ICT

competencies are similar to European Computer Driving Licence standards. These standards will be rather the same for all teachers.



Fig 9 Didactical materials and pictures

During the school year they can continually use evaluation forms to measure the effects of the exercises in order to improve the quality of sport education. [5]

Certain skills and exercises cannot be taught by developing only physical abilities, if there is no sport technical knowledge. The technique of making exercises will condition the effects of exercises on student's organism. Sport technical education represents a device for realizing goals and tasks of physical education.

Teachers use software to determinate student's attitudes and their capabilities, motor characteristics etc.

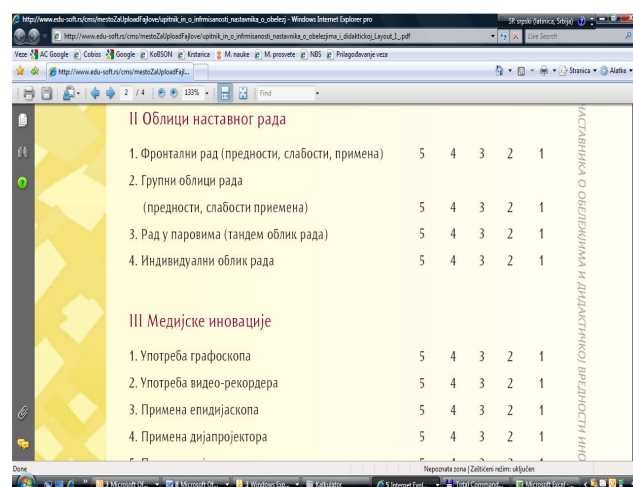


Fig 10. Software for measuring student's attitudes



Measuring their attitudes teachers can plan and organize set of physical activities according to the results. It is very important to see the influence of chosen exercises to motor characteristics.

A great deal of research show positive effects of different models of planning and realization of physical education lessons contents /2, 3, 4 and 5/.

A significant influence of handball on anthropometric characteristics, motor abilities and sport technical education was shown in the researches of Maksimovic /[8].

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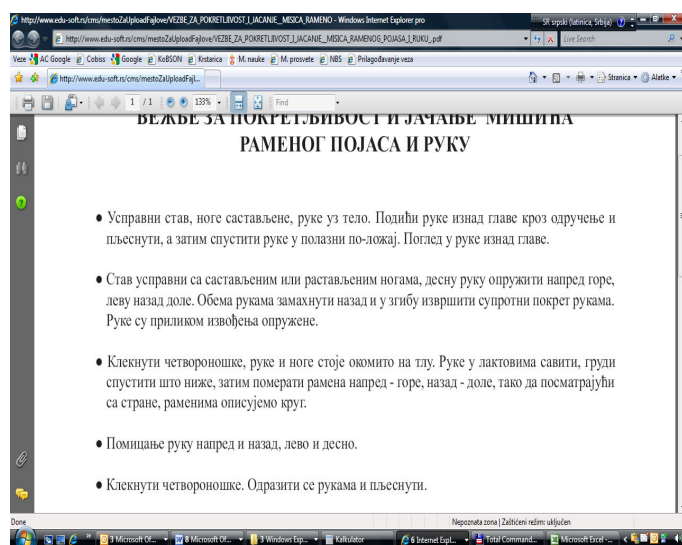


Fig. 11 Introduction for using software

In this research sport technical education was evaluated by the elements of: athletics, gymnastics exercises and floor exercises and chosen sport (handball).

## 6. Conclusion

WEB portal contain software for planning and realization classes and 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.

Planning of physical education lessons, using informational technology, with a continuous realization of programme contents had significant positive effects on improving the results of sport technical education, of male and female examines on final evaluation for all ten researched variables and as such it can be reliable basis and recommendation of modern physical education with permanent broadening of present knowledge.

Information technologies have made preconditions for improving the quality of education. In this paper we deal with WEB based software for planning,

realization and measuring the results of student's work in the area of physical education.

It is very important to have educated teachers in the area of ICT so they can understand advantages of using modern technology.

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