
TRACKING STUDENTS' PHYSICAL CAPACITY LEVELS THROUGH SYSTEMATIC MOTOR TESTING

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Abstract: The subject of this report is directly related to the physical capacity of students and monitoring its level through systematic motor testing. Specifically, the level of physical capacity of students is one of the three components that form the annual assessment in physical education and sports, and it is currently the only one that is quantitatively measurable, using a developed and established assessment system and five basic motor tests. It is measured at the beginning and at the end of the school year, i.e. twice a year. Based on this fact, our main goal is related to systematic motor testing and implementation of systematic control and established mechanisms for improving the physical capacity level of students. The main method used was a sports-pedagogical experiment conducted in a real practical environment at school. Motor testing was conducted during the last weeks of September, October, November, and December, and was incorporated into lessons during the time allocated for developing motor skills. A total of 43 third-grade students were tested, 20 of whom were boys and 23 girls. Based on the average values obtained from the four tests, analyzed by gender, key conclusions and recommendations for teachers were drawn. A large percentage of the students surveyed would receive a good grade based on their test results. Systematic motor testing would increase students' motivation to perform the main task of developing a specific motor skill in class. Teachers could also monitor progress, when there is any, and assess, based on the results, which motor skills to focus on in their lessons. For students who score lower on the tests, an individual approach could be applied, setting basic motor tasks for them to complete. Systematic monitoring of physical capacity will help teachers successfully shape it to build up students' independent skills for developing it after they finish school.

Keywords: physical capacity, systematic motor testing, students, control, motor skills

1. INTRODUCTION

The subject "Physical Education and Sports" is one of the few subjects that students study from first to twelfth grade. Education is carried out in compulsory and elective areas, planned and implemented by the teacher, in accordance with the curriculum and program for the particular grade. It concludes with the assessment of students' achievements in the educational process. As part of this process, assessment must correspond to the content, objectives, tasks, and expected competencies of the training as set out in the curricula and State Educational Standards. The final grade reflects the student's overall physical abilities (Rumenov, 2023). The assessment for the subject is based on three main components, each of which carries a different weight in the overall assessment. The component with the highest weight (50%) is related to practical tests in motor-cognitive activity, which also include theoretical knowledge. The other two components each carry a weighting of 25%, with one assessing the students' physical fitness level and the other evaluating additional activities such as class participation, helping others, independent work, and participation in sports competitions.

At present, the only component that can be measured quantitatively is that responsible for the physical capacity of students. This thesis is also supported by Chanev and Yotsov, who emphasize the fact that this is the only component involved in the formation of the final assessment in physical education and sports, carried out with precise and unified criteria for all students (Chanev and Yotsov, 2023). The presented system for assessing students' physical capacity, which includes five tests evaluating the level of basic motor skills, can be applied by all teachers in the country who teach the subject (Miladinov, 2019). The only concern is that the assessment is carried out at the beginning and end of the school year, i.e. twice a year.

In their research papers, various authors share that physical capacity is a key factor and, at the same time, an accurate and objective indicator of the effectiveness of the work done in the subject "Physical Education and Sport" (Margaritov et al., 2009; Tsankova, 2014; Marinov, 2020; Peneva, 2021). According to Naydenova, physical capacity gives an idea of the overall working capacity of the human body based on the complex development of physical qualities, i.e., above all, it is a combination of quantitative values of each individual quality (Naydenova, 2025). Therefore, in every physical education and sports lesson, the teacher should set an educational task that develops one of the students' motor skills.

Kostov et al. share that systematic control over the physical capacity of students is a necessary prerequisite for its improvement. Through it, the teacher receives timely information about the development of basic motor skills and

has the opportunity to make an thorough analysis of the effectiveness of the means and methods used for physical exercise in various forms and sports-oriented activities (Kostov et al., 2019). The authors' thesis on the implementation of systematic control over the development of students' physical abilities during the school year is also supported.

2. RESEARCH METHODOLOGY

Object and subject:

Based on our research intentions, it is logical to define the level of physical capacity of students as the object of the study and the possibility for systematic control and monitoring of the development of students' basic motor skills as the subject.

Goal and objectives:

The main objective of the scientific report is to track the development of basic motor skills through systematic motor testing using physical capacity measurement tests.

To achieve this objective, the following main tasks need to be accomplished:

To study and analyze literature and Internet sources closely related to the physical capacity and motor skills of students.

To apply tests for measuring the physical capacity of students during the school year.

Monitor the level of development of motor skills during the school year.

Implement systematic control and develop mechanisms to improve the level of physical capacity of students. To conduct the study and accomplish the set tasks, we used the following methods:

- theoretical analysis and synthesis-analysis of scientific and methodological-applied sports-pedagogical literature concerning the physical capacity of students and the development and testing of their motor skills; sports-pedagogical experiment conducted in a real practical environment at school. Motor skills testing was conducted during the last weeks of September, October, November, and December of the 2025-26 school year, and was incorporated into lessons during the time allocated for developing motor skills. At the end of the month, the lessons used the well-known and commonly applied tests for measuring physical capacity (Miladinov, O. et al., 2019): 30 m smooth running from a high start; 200 m shuttle run from a high start; 1 kg medicine ball throw overhead; standing long jump; T-test for flexibility.

- средни стойности и анализ на получените резултати. average values and analysis of the results obtained.

Study population:

43 third-grade students were studied, 20 of whom were boys and 23 girls, attending school in the town of Petrich, Bulgaria.

3. ANALYSIS OF RESULTS

After the completion of the last fourth motor skills test of the students for the 2025-26 school year, the results of the pedagogical experiment were analyzed in tables and summarized.

Table 1 shows the average values in seconds for the monitored period of motor quality speed. There were four tests, with the average values distributed by gender. The average value for boys at the beginning of the monitoring period was 6.18 seconds, and they managed to improve this achievement by 0.06 seconds in the next test in October. This tendency continues, except that the improvement in November is only 0.02 percentage points. The latest testing in December shows the largest increase in the average score, which is 5.83, an improvement of 0.27 percentage points over the previous test. Comparing the initial average value in September and the final value in December, the boys improved their results by 0.35 hundredths, i.e. we observe a smooth positive growth in their development of motor quality speed. The average value in the first motor test for girls is 6.68 seconds, which is 0.50 seconds worse than the boys. In October, there was an increase of 0.13 seconds, but in the third test in November, the average value was 6.60 seconds, meaning that the increase decreased by 0.05 seconds. The positive thing is that the latest motor test achieved an average value of 6.50 seconds, which confirms the positive growth from the second test.

Table 1: Tracking the level of motor quality speed of students

Average values in seconds of motor quality speed during the tracking period				
gender	September	October	November	December
boys	6.18	6.12	6.10	5.83
girls	6.68	6.55	6.60	6.50

Source: Author research

Table 2 shows the average values in centimeters for the monitored period of motor quality explosive strength of the lower limbs. The average value in the first motor test for boys is 143 centimeters. In the second test, a positive increase of 5 centimeters was observed, but in the third motor test, the average result was 140 centimeters, which is 3 centimeters less than the initial monitoring of motor quality. However, in the last test in December, the boys significantly improved their results from the previous test, reaching 152 centimeters, which is 12 centimeters better than the previous test and 9 centimeters better than during the follow-up period. In other words, we observed positive growth at the end of the study, even though the third test showed the lowest values. The girls' results in the first test in September were 135 centimeters, in the second test the average was 140 centimeters, in the third test 142 centimeters, and in the last test 143 centimeters. During the follow-up period, the average values increased by up to 5 centimeters by the next test. Comparing the initial and final results, an improvement of 8 centimeters was achieved.

Table 2: Tracking the level of motor quality explosive strength of the lower limbs of students

Average values in centimeters of motor quality explosive strength of the lower limbs during the follow-up period				
gender	September	October	November	December
boys	143	148	140	152
girls	135	140	142	143

Source: Author research

Table 3 shows the average values in centimeters for the monitored period of the motor quality explosive strength of the upper limbs. In the first test, the boys achieved an average value of 491 centimeters. In the second motor test, the boys lowered their average result to 477 centimeters, which is 22 centimeters worse than the initial result. However, during the motor skills test in November, they achieved their best result in the motor skills quality monitoring—510 centimeters. Their latest test result is 501 centimeters. However, they managed to improve their result by 10 centimeters since the beginning of the study. The girls achieved an average result of 445 centimeters in the first motor test. In each of the remaining three tests, they improved their average result by a minimal amount, and when comparing the results at the beginning and end of the study, a positive increase of 10 centimeters was recorded. Compared to that of boys, it is half the size, which we can consider normal, given the better developed musculature of the upper limbs in boys.

Table 3: Tracking the level of motor quality explosive strength of the upper limbs and torso of students

Average values in centimeters of motor quality explosive strength of the upper limbs during the follow-up period				
gender	September	October	November	December
boys	491	477	510	501
girls	445	451	453	455

Source: Author research

Table 4 shows the average values in seconds for the monitored period of motor endurance. The boys achieved an average result of 52.28 seconds in the initial motor testing. This improved by 2.07 seconds in the next test. In the third test in November, we observed a decrease in the result, with the boys achieving 55.46 seconds, which is 5.21 seconds worse than the previous result. In the final fourth motor skills test, they managed to improve their average result to 53.32 seconds. Comparing the two results, at the beginning and end of the study, we observe an improvement of 1.04 seconds. The girls in the motor skills test in September had a result of 58.32 seconds. In the second test, they improved their result by 0.24 seconds. In the third motor skills test in November, they achieved an average result of 57.39 seconds, and in the final fourth test, they improved it by 0.28 seconds. Their growth in motor skills assessment was also positive—1.21 seconds, which was better than the growth of the boys.

Table 4: Tracking the level of motor quality endurance of students

Average values in seconds of motor quality endurance during the follow-up period				
gender	September	October	November	December
boys	52.28	50.21	55.46	53.32
girls	58.32	58.56	57.39	57.11

Source: Author research

Table 5 shows the average values in seconds for the monitored period of motor skill flexibility. The average value for boys in the first test was 17.11 seconds. In the second test, it improved to 16.19 seconds. However, in the third test, the boys lowered their average result to 18.34 seconds. The final fourth motor test for the boys showed an average value of 17.12 seconds, which is 0.01 seconds better than the initial test. In other words, the final result for motor skill flexibility during the study period is the same as that at the beginning of the study. In September, girls achieved an average result of 18.45 seconds. This was improved by 0.30 seconds in the second test. In the third test, we again observed an improvement in their average value. The same was observed at the end of the study period, when they achieved an average result of 17.23 seconds. An increase of 1.22 seconds was achieved, which shows that the development of motor flexibility in girls is progressing smoothly and positively.

Table 5: Tracking the level of motor quality flexibility in students

Average values in seconds of motor skill flexibility during the monitored period				
gender	September	October	November	December
boys	17.11	16.19	18.34	17.12
girls	18.45	18.15	17.66	17.23

Source: Author research

3. DISCUSSION

In accordance with the requirements for publishing the article regarding the number of pages, it is not possible to present in detail more profound statistics on the primary data and analyze the students' motor test scores. We will mention that the majority of students, based on the results obtained, would receive a grade of "Good 4". We will also share that some of them showed dramatic improvements in their results from the first to the last motor skills test, and hence in the grades they received.

Based on the results obtained, we can say that the idea of monitoring the level of physical capacity of students contributed to increasing their motivation to perform better in motor testing and to give their best in completing educational tasks in physical education and sports lessons. Separately, teachers could monitor progress, if any, and assess, based on the results, which motor skills to emphasize in their lessons. They could also set individual tasks for certain students based on the lower scores obtained in the systematic motor skills testing. Systematic monitoring of physical capacity will help them successfully shape it, with the aim of building students' independent skills for developing it after completing their education.

4. CONCLUSION

As mentioned above, the measurement of physical capacity through motor testing is regulated and is carried out twice a year—at the beginning and end of the school year. In order to establish systematic control of this component of the assessment, we believe it is necessary to monitor it throughout the school year, using the same motor tests. In this way, by performing them repeatedly, students will be more relaxed and motivated to achieve better results. When students are aware of their level of physical capacity and how it increases or decreases, they are more likely to put in more effort to achieve positive growth.

Based on the results obtained, we can share some key conclusions:

Systematic motor testing of students would establish the necessary control over physical capacity.

Monitoring the level of physical capacity of students will help each of them to model the pace of development of their motor skills.

Repeatedly doing motor tests to check how fit students are during the school year doesn't mess with the other two main things that need to happen in class.

This component of the annual physical education and sports assessment needs to be performed more frequently during the school year and more assessments need to be given.

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