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### Professional Culture of the Specialist of the Future

#### COMPLEX ASSESSMENT OF PHYSICAL EDUCATION ACQUISITION BY STUDENTS IN THE SECONDARY SCHOOL

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#### *Abstract*

The Federal state educational standard is aimed at creating modern education in Russia. Gradually, programs are becoming more complex, teachers are being trained and retrained, new information and communication technologies are being used, and infrastructure is being developed. Students of educational organizations, in turn, must acquire theoretical knowledge, vital motor skills and show an adequate level of physical training. The purpose of the work is to study the problems of assessment of the students' knowledge, motor skills and physical training during Physical Education lessons, and to compare the indicators of the quality of knowledge acquisition, techniques of competitive exercises acquisition, students' physical training. At the first stage, a questionnaire of Physical Education teachers was conducted. The questionnaire consisted of questions to clarify the problem of assessing the knowledge, motor skills and physical training of students by teachers in the course of educational activities. At the second stage, a pedagogical experiment was conducted on the basis of the municipal educational institution — Gymnasium No. 2 in Ramenskoye, the Moscow Region, among the secondary school students. The indicators of the quality of knowledge acquisition, techniques of competitive exercises acquisition, physical training of students were compared. The level of theoretical knowledge was assessed in the form of written test tasks on the developed point scale. The level of motor abilities development was determined by the results of pedagogical testing. The criteria we developed will allow us to comprehensively assess the level of formation of subject competences in Physical Education among secondary school students.

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**Keywords:** Assessment, knowledge, skills, Physical Education, lesson, exercises.



## 1. Introduction

The federal state educational standard is aimed at creating modern education in Russia. Today, programs are becoming more complex, new information and communication technologies are being used (Ababkova, Pokrovskaia, & Trostinskaya, 2018; Bakayev, Vasilyeva, Kalmykova, & Razinkina, 2018; Bylieva, Lobatyuk, & Rubtsova 2018; Bylieva & Sastre, 2018; Fersman, Zemlinskaya, & Novak-Kalyayeva, 2017; Shipunova & Berezovskaya, 2018; Sokolova, Pylkin, Stroganova, & Antonian, 2018; Tyapin, Nazarkina, & Reshetnikov, 2016). Education standard requires a different level of education from the teacher. The teacher should ensure, on the basis of a system-activity approach, the implementation of the standard requirements for the results of mastering the main educational program (Rivkin, 2014).

In accordance with the requirements of the Federal State Educational Standard, each educational institution draws up its own educational program, which includes programs of individual academic subjects. Each program in the subject, in addition to the content section, must contain a system for assessing the achievement of the planned results.

In the state programs on the subject of Physical Education, that teachers used before the introduction of the Federal State Educational Standard, there was a section on the level of development of students' physical training, which included requirements for knowledge, motor skills, and level of physical training. In modern school, Physical Education lesson mainly involves movement exercises aimed at sports results. The curriculum of the subject also includes the theory section, where students should receive theoretical knowledge of Physical Education and sports. In fact, the lesson of Physical Education does not fully meet the requirements (Vasiliev, 2013). The textbooks for Physical Education teachers who work according to the Federal State Educational Standard describe the organization and methodology for assessing only motor skills. In modern exemplary programs, there are no criteria for assessing the formation of subject results of mastering the educational program on the subject Physical Education.

## 2. Problem Statement

To study the problem of assessing students' knowledge, motor skills and physical training by teachers in Physical Education lessons, a survey was conducted among Physical Education teachers in the Moscow Region (12 people) and Moscow (4 people).

**2.1.** The respondents rate the level of theoretical knowledge of their students by survey (100% of responses), review works and presentations (44% of responses) and tests (37.5% of responses). For the compilation of questionnaires and tests teachers use textbooks on Physical Education and the manual of V.P. Lukyanenko "Physical Education: The Basics of Knowledge", teaching guides by V.I. Lyakh and A.A. Zdanevich. None of the teachers indicated manuals on theoretical preparation for the Physical Education Olympiads for schoolchildren. Among the theoretical topics studied by students, the teachers did not indicate the "History of the Olympic Movement" and "The History of the Development of Sports".

**2.2.** For the assessment of motor skills technique, four Physical Education teachers indicated that they use tests, but could not describe the authors of the tests and how to carry them out. Assessment of motor action acquisition is carried out by teachers visually. Two teachers noted

that before the practical implementation of the exercise, they ask the student to explain the sequence of the motor action he had studied, putting two marks at the same time (knowledge + skill). The teachers do not develop scales for assessing the quality of performing motor actions independently. For 100% of respondents criteria for assessing the motor action quality of students are descriptions of the technique of movement, presented in the methodological manuals for Physical Education teachers.

- 2.3. Twelve teachers assess the level of motor abilities development using the normative tables and tests proposed by V.I. Lyakh and A.A. Zdanevich in the Comprehensive Physical Education Program for grades 1-11, and also by V.I. Lyakh in textbooks for teachers of 5-9 and 10-11 grades "Physical Education. Test control", as well as I.I. Dolzhikov in the recommendations "Planning and content of the Physical Education lessons for grades 1-11". Four Physical Education teachers take into account the results of passing the standards of the complex "Ready for work and defense" and Presidential competitions. Five teachers indicated that they perform the control of the motor abilities level in the form of competitions

### **3. Research Questions**

- 3.1. To study the criteria for assessing the students' knowledge, motor skills and physical qualities.
- 3.2. To study the significance of students' theoretical and practical preparedness.
- 3.3. To develop and implement the criteria for the comprehensive assessment of Physical Education acquisition by students.

### **4. Purpose of the Study**

The purpose of the work is to study the problems of assessment of the students' knowledge, motor skills and physical training during Physical Education lessons, and to compare the indicators of the quality of knowledge acquisition, techniques of competitive exercises acquisition, students' physical training.

- 4.1. At the first stage, a questionnaire of Physical Education teachers was conducted. Physical Education teachers from the Moscow region (12 people) and Moscow (4 people) took part in the questionnaire. The questionnaire consisted of questions to clarify the problem of assessing the knowledge, motor skills and physical training of students by teachers in the course of educational activities. Before the questionnaire Physical Education teachers were informed about the goals and objectives of the study.
- 4.2. At the second stage, a pedagogical experiment was conducted on the basis of the municipal educational institution — Gymnasium No. 2 in Ramenskoye, the Moscow Region, among the secondary school students. Two control groups of 35 people were formed. The indicators of the quality of knowledge acquisition, techniques of competitive exercises acquisition, physical training of students were compared. The level of theoretical knowledge was assessed in the form of written test tasks on the developed point scale. The quality of the technique of movements acquisition was assessed visually by a 40-point system. The level of motor abilities development was determined by the results of pedagogical testing.

## 5. Research Methods

The following methods were used to conduct the study: a questionnaire method, which allows studying the problem of assessment of students' knowledge, motor skills and physical training in Physical Education classes; pedagogical testing to assess the level of physical qualities development; pedagogical observation - to assess the acquisition of motor action; written test - to assess the level of students' knowledge; mathematical methods - to analyse the results of the study.

## 6. Findings

During the intermediate assessment of 70 students in the subject of Physical Education, we found out that 60 of them have an "excellent" mark, 7 people have "good" and 5 people as well have "satisfactory". We decided to find out how realistic and reasonable this assessment is. To do this, we evaluated their preparedness on the subject in three main indicators: knowledge, motor skills and physical training on the scale we developed.

The results are presented in table 01.

**Table 01.** The results of students' Physical education acquisition

Mark (point)	Indicator		
	Knowledge	Motor skills	Physical training
"5"	28 people	13 people	58 people
"4"	30 people	30 people	7 people
"3"	12 people	27 people	5 people

It turns out that the subject acquisition is determined by indicators of physical training, which reduces the importance of the teacher's role in the main activity - to transfer knowledge and skills. About 50% of the students in this group should get a real excellent mark in this situation.

At the end of the first year of the experiment, it can be noted that the average score in CG1 on the level of knowledge (subject matter acquisition) was 22 points (65%), in CG2 - 17 points (42%).

In order to compare the indicators of the quality of knowledge acquisition, techniques of competitive exercises acquisition, physical training, students need to be certified in each term according to current assessments, as well as from test results conducted throughout the school year (Garina & Lepeshkina, 2016). Students of the 8th and 9th grades took part in the experiment. The pedagogical experiment was carried out at the general educational institution, gymnasium No. 2 in Ramenskoye, the Moscow Region, from September 2016 to May 2018. There were formed a control group 1 (CG1) - 35 people and a control group 2 (CG2) - 35 people. In CG1, the theoretical part was allocated 3 hours per term, which included a description of different sports (athletics, gymnastics, skiing, sports games): the application of these types, their biomechanical indicators. The students watched videos about the technique of movements, containing sound in the form of explanations. Difficult elements were demonstrated in slow motion mode for better perception of educational material. The technique of this motor action was analyzed and discussed at different stages of its acquisition. Characteristic motor mistakes were identified and eliminated. It is necessary to note the importance of using visualization tools, stands, and also technical tools in Physical

Education lessons. For homework manuals and textbooks on Physical Education were recommended. Theoretical knowledge of motor technique was subsequently applied in practice. Practical Physical Education training was conducted 3 times a week.

In CG2 during the 2016-2017 school year at the Physical Education lessons, the transfer of knowledge was performed during the practical implementation of the exercises. Video materials were not used in this group during the motor action acquisition. The study of motor actions was carried out in the traditional way.

At the end of the school year, students of the 8th grade had a written test. The assessment criteria for basic knowledge are the following: the student was given 1 point for each correct answer. 0 points - for the wrong answer. 0.25 points were given for each correct answer if there were several answer options in the question; for the wrong answer 0.25 points were deducted. The maximum number of points that a student could be given when answering all the test questions was 40 points.

The student must have a technical skill of motor action to show a high result of physical training. We chose the following test exercises (Kurneshova, 1998; Lyakh, 2007): cross-country race 1000m (min./sec.), 60m run from a high start (sec.), standing long jump (cm), throwing a small ball at a distance (m), shuttle run 3x10m (sec.).

The sequence of training in the CG1 is the following: the technique of performing motor actions was discerned, mistakes in the technique were detected, and special exercises were used to correct motor mistakes and skill formation.

Knowing his own mistakes, it will be easier for the student to understand the cause of their occurrence, and to find the means to correct them. For students, the key to successful technical actions acquisition will be compliance with the rules of training and the prevention of motor mistakes.

Before allowing students to the test on a grading scale, the technique of motor actions was assessed (Table 02)

**Table 02.** Criteria for assessing the motor action of students 15-16 years old

<b>Points</b>	<b>Performance technique</b>
40	Motor action is performed correctly, accurately, confidently, freely.
30	Motor action leads to inaccurate performance of the technique part and is performed with minor mistakes (no more than 2).
20	There is a mistake in the motor action leading to an unfulfilled technique part, or three mistakes are made leading to inaccurate performance of the part.
10	Motor action is not performed correctly, the base technique has been distorted.

In each term, students must be certified for current grades as well as for test results conducted throughout the school year.

To perform the control standards, all exercises were assessed on a grading scale. From the total points scored each student received a mark.

The final mark for a term was the sum of the points received by students for the following sections in the field of Physical Education: knowledge, motor skills and physical training.

The results of the technical skills assessment are presented in table 03.

**Table 03.** Technical preparedness of students of control groups for the 2016-2017 school year (average point)

Indicator	Control groups		Difference in points
	CG1	CG2	
Sprint race	31.4	32	0.6
Long-distance run	32.8	30.2	2.6
Standing long jump	30	26.8	3.2
Small ball throwing	32.8	28.2	4.6
Shuttle run	36.2	33.4	2.8

The technique of such motor actions as long-distance run and shuttle run is acquired on average 2.6 points better in CG1, and standing long jump and small ball throwing at a distance in the same group are studied better by more than 3 points (3.2 and 4.6 points respectively).

The results of physical training assessment are presented in table 04.

**Table 04.** Physical training of students in the control groups for the 2016-2017 school year (average point)

Indicator	Control groups		Difference in points
	CG1	CG2	
Sprint race	18.2	18.2	0
Long-distance run	16.8	15.0	1.8
Standing long jump	15.1	11.2	3.9
Small ball throwing	18.8	16.1	2.7
Shuttle run	27.9	27.6	0.9

In CG1 at the end of the 2016-2017 school year, the level of development of speed-power abilities also turned out to be higher, which is confirmed by the test results expressed in points: 4.1 points more in standing long jump and 2.7 in small ball throwing.

All in all, the general level of preparedness on the subject of Physical Education in CG1 in the 2016-2017 school year was 278.2 points compared to CG2 - 254.8 points, which is 23.4 points higher.

In the 2017-2018 school year, students of CG2 studied the subject of Physical Education in the same methodical scheme that was used in CG1.

The level of mastering the discipline was assessed comprehensively by three indicators: knowledge, motor skills and physical training. The results of the study are presented in table 05.

**Table 05.** Complex assessment of 8-9 grades students in Physical Education

parameters		2016/2017 school year	2017/2018 school year	Significance of differences (p)
Assessment of theoretical knowledge		18.1±5.8	20.1±5.0	< 0.05
Technique indicators	60m run from a high start	31.1±6.8	36.3±4.9	> 0.05
	cross-country race 1000m	32.9±7.5	37.1±4.6	> 0.05
	standing long jump	30.0±8.7	35.1±6.6	> 0.05
	throwing a small ball at a distance	32.9±8.3	36.6±5.4	> 0.05
	shuttle run 3x10m	36.3±5.5	39.4±2.4	< 0.05
	60m run from a high start	18.2±7.5	23.1±7.5	< 0.05

Physical training indicators	cross-country race 1000m	16.9±8.2	21.7±7.9	< 0.05
	standing long jump	15.2±9.6	20.5±10.7	< 0.05
	throwing a small ball at a distance	18.8±7.0	23.5±8.5	< 0.05
	shuttle run 3x10m	27.9±5.7	30.3±4.2	< 0.05
The total points		278.2±47.3	323.8±42.0	< 0.05

As a result of statistical processing using the Wilcoxon criterion ( $p = 0.05$ ), it was possible to identify that significant changes were noted in the following indicators - the theoretical knowledge assessment, in all parameters of physical training, as well as in the 1st parameter of motor action (shuttle running); in the other parameters of the technique indicators there was a positive dynamics, the statistical processing did not reveal significant changes.

Since there is a 5-grade system of knowledge assessment in Russia, we have developed a scale on the basis of total points. To get a "5" (excellent), the student must have more than 350 points; "4" (good) - from 349 to 260 points; "3" (satisfactory) - from 259 to 180 points; less than 180 points - "2" (unsatisfactory). The results of the study are presented in table 06.

**Table 06.** The results of a complex assessment of students in Physical Education subject

Mark	CG1		CG2	
	2016-2017 school year	2017-2018 school year	2017-2018 school year	2017-2018 school year
Excellent	4 people	11 people	1 people	5 people
Good	19 people	22 people	16 people	22 people
Satisfactory	12 people	2 people	18 people	8 people

The table shows that after the introduction into the educational process of complex assessment of Physical Education acquisition results, the number of students who have mastered the discipline for "4" and "5" in both control groups increased by 28.5%.

## 7. Conclusion

**7.1.** Physical Education teachers indicated in the questionnaire that they assess the level of theoretical knowledge with review works, presentations and tests. The teachers assess the technique of motor action visually. The teachers do not develop scales for assessing the quality of motor actions performance. They assess the level of motor abilities development by using regulatory tables and tests; take into account the results of control standards of the complex "Ready for work and defense" and Presidential competitions; carry out in the form of competitions

**7.2.** As a result of statistical processing it was possible to identify significant changes in the following indicators: the theoretical knowledge assessment, in all parameters of physical training, as well as in the 1st parameter of motor action (shuttle running); in the other parameters of the technique indicators there was a positive dynamics, the statistical processing did not reveal significant changes

- 7.3. The introduction into the educational process of complex assessment of Physical Education acquisition results, the number of students who have mastered the discipline for “4” and “5” in both control groups increased by 28.5%.

## References

- Ababkova, M. Y., Pokrovskaya, N. N., & Trostinskaya, I. R. (2018). Neuro-technologies for knowledge transfer and experience communication]. *European Proceedings of Social & Behavioural Sciences*, 35, 10-18. <https://doi.org/10.15405/epsbs.2018.02.2>
- Bakayev, V., Vasilyeva, V., Kalmykova, S., & Razinkina, E. (2018). Teoriya fizicheskoy kul'tury - massovyy otkrytyy onlayn-kurs v uchebnom protsesse [Theory of physical culture- a massive open online course in educational process]. *Journal of Physical Education and Sport*, 1, 293-297. [Rus].
- Bylieva, D., Lobatyuk, V., & Rubtsova, A. (2018). Serious games as a recruitment tool in educational projects. *18th PCSF 2018 Professional Culture of the Specialist of the Future. The European Proceedings of Social & Behavioural Sciences, Vol. LI*, 1922-1929. <https://doi.org/10.15405/epsbs.2018.12.02.203>
- Bylieva, D., & Sastre, M. (2018). Classification of educational games according to their complexity and the player's skills. *The European Proceedings of Social & Behavioural Sciences*. 51, 438-446. <https://doi.org/10.15405/epsbs.2018.12.02.47>
- Fersman, N. G., Zemlinskaya, T. Y., & Novak-Kalyayeva, L. (2017). E-Learning and the World University Rankings as the Modern Ways of Attractiveness Enhancement for the Russian Universities]. In K.S. Soliman (Ed.), *IBIMA 2017 - Proceedings of the 30th International Business Information Management Association Conference, IBIMA 2017. Vision 2020: Sustainable - Economic development, Innovation Management, and Global Growth*, (pp. 927 – 944). Madrid, Spain: IBIMA
- Garina, E. V., & Lepeshkina, S. V. (2016). Ocenka Resultatov osvoeniya soderezaniya predmeta “Fizicheskaya kultura” uchaschimisya 6-7 klassov [Assessment of the results of Physical Education acquisition by students of the 6th-7th grade]. *Academic notes of the University P.F. Lesgaft, 11* (141), 40-44. [In Rus].
- Kurneshova, L. E. (1998). *Planirovanie soderezaniya urokov fizicheskoy kul'turi I-IX klassov, Seriya: “Instruktivno metodicheskoe obespechenie soderezaniya obrazovaniya v g. Moskve” [Planning the content of lessons of physical culture I – IX classes, Series: "Instructional and methodological support of the content of education in Moscow"]*. Moscow: Centre of innovation in pedagogy. [In Rus]
- Lyakh, V. I. (2007). *Fizicheskaya kultura: 5-9 klass: testoviy kontrol': posobie dlya uchitelya [Physical culture: 5-9 cl.: test control: teacher's guide]*. Moscow: Prosvetshenie. [In Rus]
- Rivkin, E. Y. (2014). *Professionalnaya deyatel'nost' uchitelya v period perehoda na FGOS osnovnogo obshchego obrazovaniya. Teoriya i tehnologii [Professional activities of the teacher during the transition to the GEF basic general education. Theory and Technology]*. Volgograd, Russia: Teacher [In Rus]
- Shipunova, O. D., & Berezovskaya, I. P. (2018). Formation of the specialist's intellectual culture in the network society. *The European Proceedings of Social & Behavioural Sciences*, 51, 447-455. <https://doi.org/10.15405/epsbs.2018.12.02.48>
- Sokolova, N. A., Pylkin, A. A., Stroganova, O. A., & Antonian, K. G. (2018). Plyusy i minusy distantsionnogo obucheniya [The pros and cons of distance learning]. *The European Proceedings of Social & Behavioural Sciences*, 51, 1478-1486. <https://doi.org/10.15405/epsbs.2018.12.02.157>
- Tyapin, A. N., Nazarkina, N. I., & Reshetnikov, I. S. (2016). *Sozдание avtomatizirovannih sistem “Fizkulturniy monitoring” - kak mehanizma upravleniya fizicheskoy podgotivlennostyu i normirovaniya fizicheskikh nagruzok skolnikov [Creation of automated systems "Physical culture monitoring" - as a mechanism for managing physical preparedness and normalizing physical loads of schoolchildren]*. [Monograph]. Moscow Institute of Open Education [In Rus]
- Vasiliev, S. A. (2013). Realizatsiya i osvoenie uchashimisya osnovnoy obrazovatel'noy programmi nachal'nogo obshchego obrazovaniya po fizicheskoy kul'ture [Realization and mastering by students of the basic educational program of primary general education in Physical Education]. *Vestnik of the I.YA. Yakovlev Chuvash State Pedagogical University*, 4(80), 3, 11-16 [In Rus].