

# Harmonization of students' physical fitness using the group method

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## Abstract

**Objective of the study** was to search, test and implement methods of organizing the educational process that contribute to the harmonization of the physical fitness of male students.

**Results and conclusions.** The article concretizes the concepts of harmonious physical readiness of students and lagging behind physical qualities. Based on the results of the study, model characteristics of the development of the main physical qualities of modern students were determined, a classification of male students was developed according to the level and harmony of physical fitness. A technology for determining the lagging indicators of the development of physical qualities of students is proposed.

The article substantiates the expediency of using blocks of physical exercises for the development of lagging physical qualities. An effective form of organizing the implementation of these exercises is a group method using temporary typical subgroups. Subgroups are formed according to the results of testing and include students with lagging indicators of the physical quality developed in this part of the lesson. As a result of the experiment, the effectiveness of this technique was proved. By the end of the experiment, the number of students with harmonious physical fitness increased significantly.

**Keywords:** *harmonization, lagging physical qualities, physical fitness, model characteristics, blocks of physical exercises, students, differentiated approach, typical subgroups.*

**Introduction.** At present, in higher education, when organizing the educational process in the discipline "Physical Culture and Sports", a sportized approach has become widespread. The main feature of this approach is the emphasis on the development of physical qualities and motor skills that are important for the chosen sport. This approach has a significant number of positive aspects, one of which is the high motivation of students.

However, the desire for maximum achievements in the level of development of physical qualities that are significant for the chosen sport should not be in conflict with the principle of harmonization. This principle is manifested in the balance, proportionality of the development of various physical qualities. Both insufficient and excessive level of development of one or

another physical quality or functional system can negatively affect the effectiveness of training and sports results [1].

Previous studies and analysis of the current situation in the labor market led to the conclusion about the need for versatile harmonious physical fitness of university graduates [2-4].

Harmonious physical development is understood as the correspondence of the level of development of the basic physical qualities and anthropometric indicators of an individual to gender, age and population norms.

By harmonious physical readiness we understand the proportionality of the levels of development of individual physical qualities of a student to the general level of his physical readiness. Consequently, lagging



physical qualities are qualities whose development indicators are lower than those of most of the qualities of a given student.

Determining the required level of development of basic physical qualities, the ratio of indicators of development of individual physical qualities, requires a detailed study of the requirements of social and future professional activities.

**Objective of the study** was to search, test and implement methods of organizing the educational process that contribute to the harmonization of the physical fitness of male students.

**Methods and structure of the study.** During the experiment, a battery of tests was used to control the development of basic physical qualities.

During the search experiment, 400 male students of the main medical group of the 1st and 2nd courses of the Omsk State Transport University were tested. Based on the test results, average group indicators of the development of students' physical qualities and percentile scales for evaluating these indicators were calculated. Using the obtained average group indicators of the development of physical qualities, the model characteristics of the development of physical qualities of modern students of a transport university were determined.

The basis of the chosen approach is the harmonization of physical fitness through the accentuated development of lagging physical qualities. One of the tasks to be solved was the development of a methodology for identifying lagging indicators that characterize the development of basic physical qualities.

**Table 1.** Model level of development of physical qualities and functional indicators of the cardiorespiratory system

Control exercise, test	Model level
2000 m run, s	555 – 525
Pull-ups from the hang on the high bar, the number of times	7 – 12
Flexion-extension of arms in an emphasis lying, number of times	23 – 29
Raising the legs in an emphasis on the forearms, the number of times	19 – 24
Long jump from a place with a push with two legs, cm	225 – 239
Shuttle run 3 10 m (T2), s	8 – 7,6
30m run (T1), s	4,7 – 4,5
Index of coordination abilities in motor locomotions (T2 – T1), s	3,3 – 3,1
Tilt forward from the main rack, cm	5 – 10

As part of the study, using percentile scales, a classification of students' preparedness by level and harmony was developed. Further, the criteria and methodology for identifying lagging physical qualities were determined.

At the next stage of the study, methods were identified, theoretically substantiated and experimentally tested, contributing to the harmonization of students' physical fitness.

When determining the model characteristics, the proper and standard values of the indicators of the tests used were taken into account. The model level of development of physical qualities is in the range from 31 to 68 percentiles on the percentile scale, which corresponds to  $\bar{X} \pm 0.5\sigma$  according to the normal distribution law. In our opinion, this is the optimal level of development of physical qualities of students, necessary for successful educational, social and labor activities (Table 1).

Indicators of the development of physical qualities, exceeding 68 percentiles, correspond to the level of "above the model". The results of students in tests that characterize the level of development of physical qualities, less than the 31st percentile of the assessment scales calculated by us, correspond to an unsatisfactory assessment of the control standards of the university curriculum, are at the lower limit of the norm or below the norm for healthy people of this age and, in our opinion, need to be corrected. That is, in our study, the model level of indicators of the development of physical qualities corresponds to the average level of development of these qualities of the totality of students of a technical university examined by us.

The use of percentile scales made it possible to compare the indicators of the development of physical qualities, presented in different units of measurement, and to develop a classification of students' physical fitness by level and harmony (Table 2).

This made it possible to identify lagging physical qualities for further accentuated development in training sessions within the framework of the group method. We consider lagging physical qualities as qualities, the level of development of which is lower than other physical qualities of a given student, corresponding to the level of his physical fitness. Lagging behind physical qualities are students with a disproportionate development of basic physical qualities.

For the effective organization of the process of physical education of students of different levels of preparedness within the framework of group classes, it is necessary to implement a differentiated ap-

**Table 2.** Classification of physical fitness of students by level and harmony

Harmony and level of physical fitness	Characteristic physical readiness of students	Share of the studied population, %
Harmonious development of a low level	The level of all indicators of the development of physical qualities is below the model	3
Harmonious development of the middle level	The level of all indicators of the development of physical qualities corresponds to the model	6
Harmonious development of a high level	The level of all indicators of physical qualities testing is higher than the model	5
Disharmonious development of a low level	Level, at least 6 * indicators of the development of physical qualities below the model	19
Disharmonious development of the middle level	Level, 5* or more test indicators, corresponds to the model and above, but there are indicators with a level below the model	59
Disharmonious development of a high level	The level of physical qualities testing indicators is higher than the model and model. There are no indicators below the model level	8

\*Note. Here and below - from the nine indicators of the development of physical qualities studied by us.

proach. This approach provides for the division of the study group of students into subgroups according to certain typical features. In this study, we used temporary typical subgroups formed for one or more lessons. The composition of these subgroups depended on the pedagogical tasks being solved and individual indicators of the development of individual physical qualities of students. When using the group form of organizing a lesson, students were divided into two temporary subgroups. The first subgroup included students with lagging indicators of the physical quality developed in this part of the lesson. The remaining students of the study group were included in the second subgroup.

To achieve harmonious physical fitness at each lesson, an additional training effect was exerted on the lagging physical qualities of students of the temporarily formed first subgroup. This subgroup included students with lagging indicators of developed physical quality. Students of the second subgroup performed exercises aimed at the complex development of physical qualities.

A block of exercises developing lagging physical qualities was included in different parts of the lesson. This depended on the expediency of performing exercises that develop one or another quality. Thus, exercises aimed at developing speed and coordination abilities were performed at the beginning of the main part of the lesson. And exercises to increase endurance were performed at the end of the session.

To test the effectiveness of our methodology, a pedagogical experiment was conducted on the basis of the Omsk State Transport University. 48 male stu-

dents of the main medical group of the second year of study took part in the experiment. The duration of the experiment was one academic year. The participants of the experiment were divided into control (n=24) and experimental (n=24) groups.

In the control group (CG) classes were held according to the traditional program of complex development of physical qualities without taking into account lagging indicators. The experimental group (EG) was engaged according to the experimental methodology with the use of a block of physical exercises aimed at developing lagging physical qualities at each lesson. The exercises were performed in a group method using temporary typical subgroups. Lagging indicators of the development of physical qualities were determined by the results of testing.

At the beginning and end of the experiment, the level and harmony of the development of physical qualities of the control and experimental groups were tested.

**Results of the study and their discussion.** As a result of the pedagogical experiment, using the methods developed by us for the accentuated development of lagging behind physical qualities of students using a differentiated approach, the following was established in the experimental group:

- Statistically significant positive changes in the performance of students of the experimental group were achieved in the tests "Running for 2000 meters", "Pull-up from the hang on a high bar", "Flexion and extension of the arms in the lying position", "Raising the legs in emphasis on the forearms", "Jump in length from a place with a push with two legs", "Shuttle run



3 × 10 m”, in a test characterizing the coordination abilities manifested in locomotion, and “Bending forward from a standing position on a gymnastic bench”;

- no statistically significant changes were found in the parameters of the “Running for 30 m” test during the experiment;

- by the end of the experiment, the number of students who achieved proportionality in the development of physical qualities increased significantly (from 8 to 33%);

- when analyzing the individual profiles of the students of the experimental group, an improvement in the level and proportionality of the development of physical qualities and functions of the cardiorespiratory system was noted.

**Conclusion.** As a result of the conducted pedagogical experiment, the effectiveness of the methodology based on a differentiated approach using blocks of physical exercises aimed at developing lagging physical qualities was proved. An effective organizational form of this part of the lesson is a group method using temporary typical subgroups.

## References

1. Koksharov A.V. Obosnovaniye modelnogo urovnya razvitiya fizicheskikh kachestv studentov tekhnicheskogo vuza s ispolzovaniyem pertsentilnykh shkal [Substantiation of the model level of development of physical qualities of students of a technical university using percentile scales]. Uchenye zapiski universiteta im. P.F. Lesgafta. 2019. No. 1 (167). pp. 162-166.
2. Platonov V.N. Dvigatelnyye kachestva i fizicheskaya podgotovka sportsmenov [Motor qualities and physical training of athletes]. Moscow: Sport publ., 2019. 656 p. ISBN 978-5-9500183-3-6.
3. Khramova N.A., Kuznetsova Z.M. Formirovaniye fizicheskogo samoimidzha studentov v protsesse fizicheskogo vospitaniya v vuze [Formation of physical self-image of students in the process of physical education at the university]. Teoriya i praktika fizicheskoy kultury. 2008. No. 8. pp. 87-92.
4. Castells, M. The Information Age: Economy, Society and Culture. Oxford (UK): Blackwell Publishers, 1998. Vol. 3: End of Millenium. 418 p.