Aripov Yunus Yusupovich
Uzbek state university of physical education and sport
Professor of the department of management and organization of sports events, candidate of pedagogical sciences
E-mail: aripovyunus179@gmail.com

STRUCTURAL-TOPOLOGICAL STRUCTURE OF TEACHING PHYSICAL EDUCATION

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Annotation. This article theoretically substantiates the structural-topological framework for teaching physical education based on a differentiated approach, taking into account the level of physical fitness, psychophysiological characteristics, and motor skills of students in the context of general secondary schools.

Keywords: differentiated approach, pedagogical model, motor skills, grouping of students, individualized education, assessment criteria.

In the modern education system, the subject of physical education is recognized as one of the important factors ensuring not only the formation of a healthy lifestyle for students but also their comprehensive development.

From this perspective, the necessity of organizing the educational process by taking into account the level of physical development and physical fitness of students is increasing day by day. A need arises to maximize the potential of students by organizing classes while taking into account their individual physical, psychological, and intellectual characteristics.

In recent years, numerous scientific studies have been conducted on improving the physical education system based on differentiated and individual approaches. Such approaches are gaining significant importance, especially when working with students possessing different levels of physical fitness in general secondary schools.

The importance of applying a differentiated approach in physical education classes is further strengthening due to distinctions based on students' motor activity, learning ability, nervous system characteristics, and temperaments.

However, it is observed that the structural-topological framework of teaching physical education based on a differentiated approach has not been sufficiently developed in existing theoretical-methodological works. In particular, there is a need for scientifically grounded solutions in the field of systematically applying pedagogical technologies adapted to the developmental stage of each student, defining assessment criteria, and optimizing classes.

Therefore, the theoretical foundations, systemic components, methods of organization, and efficiency criteria of teaching differentiated physical education for school students are analyzed [in this study]. Furthermore, proposals and recommendations are provided for forming a practical model of the differentiated approach based on advanced experiences.

The aim of the research is to systematically analyze scientific-theoretical experiences, conceptual approaches, and practical experiences regarding the teaching of differentiated physical education in general secondary schools.

Tasks of the research:

to identify and scientifically analyze the main principles, conditions, and components of the differentiated approach based on existing scientific literature, concepts, and studies;

to characterize differentiated approaches regarding the consideration of individual differences of students in physical education classes;

to determine methods of differentiated grouping, assessment, and adaptation of students' physical, psychomotor, psycho-

logical, and pedagogical characteristics;

to develop and improve the structural-topological model of teaching physical education organized on the basis of a differentiated approach.

Results and discussion. In determining the effectiveness of teaching differentiated physical education, the current state of this system among school students was primarily analyzed. To this end, existing theoretical developments and practical experiences were examined.

Existing approaches regarding pedagogical technologies and the theory of physical education were analyzed, identifying aspects that have not yet been sufficiently studied or fully developed. Through this, directions were established for improving the technology of physical education based on a differentiated approach.

It is known that the ability to master movements - that is, the ability to acquire motor activities - depends on factors such as the student's body structure, psychological state, physical and functional fitness, and the activity level of the body's systems.

In this regard, R.S. Salamov, B.Sh. Madaminov, and Z.I. Kuznetsova propose dividing students into three groups based on their level of mastery [5, 3, 2]:

a) Students who master motor skills perfectly and quickly. They possess a good level of physical development and physical fitness, as well as high performance indicators (good or excellent) in all subjects;

b) Students who master motor skills at a good or excellent level, but more slowly. Their level of physical development is average, and their academic performance in other subjects is often good, though sometimes satisfactory;

c) Students who master motor skills at a weak or poor level. Their level of physical development is low, movement coordination is poor, and they have health limitations. Their academic performance in other subjects varies.

Maximum opportunities were identified for dividing students in each class into differentiated-individual groups. When conducting this exercise starting from the 5th grade, the teacher specifies the number of repetitions in the lesson plan as follows: 10 times (for students showing below-average results), 11 to 30 times (for those showing average results), and more than 31 times (for those showing above-average results) (Table 1).

The physical development, psychological characteristics, and motor activity of general secondary school students consist of distinct stages. Therefore, it is necessary to take into account the individual capabilities of each child when organizing physical education classes. The differentiated approach stems precisely from this need. In this context, a mechanism is presented for dividing students of each class into groups based on their physical condition, health, and level of activity. This allows for the selection of the appropriate workload, training form, and method for each child.

The authors of this classification attempt to demonstrate that the level of physical

Table 1

The system for dividing students into differentiated-individual groups

Groups	Indicators			
	Physical development	Physical fitness	Work capacity	Temperament properties
	1	2	3	4
A. Strong	High, above average	High, above average	High, above average	1. Extraversion-introversion 2. Rigidity 3. Emotional excitability 4. Changes in physical and psychological state 5. Activity
B. Average	Average	Average	Average	
C. Weak	Below average, low	Below average, low	Below average, low	

Table 2

Differentiation of educational tasks based on the level of physical fitness

Type of exercise	Group 1 (Strong)	Group 2 (Average)	Group 3 (Weak)
Running high jump	Target height at chest level	Target height at waist level	Target height at mid-thigh level
Pull-over (on horizontal bar)	Performed hanging on the high bar	Performed hanging on the medium-height bar	Performed on the low bar with partner assistance
Rope climbing	For speed – climbing as fast as possible	By distance – climbing to a designated height	Performed using special training aids or devices

development and physical fitness is, in all cases, considered a significant factor in students' ability to master skills. Furthermore, the level of academic performance in other subjects, the quality of movement coordination, or limitations in health status also exert an influence.

Many researchers recommend defining the requirements placed on students based on differentiated approaches, depending on their level of physical development and physical fitness.

R.S. Salamov and B.Sh. Madaminov emphasize that it is expedient to assign different tasks for three main groups—students with strong, average, and weak physical fitness (see Table 2).

This differentiated approach serves to adapt physical education lessons to each student's individual potential, prevent excessive strain and psychological pressure, and reveal the opportunities for each student's maximal development.

In a similar manner, it is possible to organize the differentiation of any movement task. By gradually complicating exercises and increasing the workload, it is possible to bring even students with weak physical fitness to perform exercises at the required standard level of the physical education curriculum.

The level of personal preparedness is determined by the student's motor experience, that is, the richness of movement-related knowledge. Students with rich motor experience have a higher level of mastery. Such students can often repeat a new movement immediately after a demonstration, whereas those with less experience are observed to master the movement gradually, by breaking it into parts.

Therefore, the authors propose a differentiated methodology taking into account three groups (strong, average, weak). Here, the groups are formed independently by the students based on their capabilities and interests. A group leader is appointed to assist in the lesson for each group. The teacher gives assignments appropriate to the level of each group. After less prepared students master an exercise, they are offered a complex task of the next level. In this process, students are not allowed to move from one group to another.

For example, according to B.Sh. Madaminov's proposal, students are divided into groups as follows [5]:

strong group – active, daring, quick, and striving to over-fulfill tasks;

average group – not sufficiently decisive, but hardworking, consistent, and trying to fulfill tasks;

weak group – shy, passive, showing no initiative.

As noted by Z.I. Kuznetsova and B.Sh. Madaminov, students with a strong and stable nervous system master material stably, whereas students with a weak and unstable nervous system act with sharp rises and falls in learning [2, 5].

P.K. Sakha distinguishes two types of individual psychological differences affecting the quality of mastering educational material [4]:

Genotypic differences – individual differences based on the student's innate characteristics, abilities, and talent.

Phenotypic differences – differences re-

lated to the influence of conditions in the educational process, the learning environment, methods, and means on mastery.

The quality of students' mastery of educational material is formed especially by the interaction of these two differences. The first group of differences determines the correspondence of educational tasks to the student's physical, mental, and motor potential. The second group of differences determines the student's level of readiness to master educational methods and forms.

Another important aspect of the differentiated approach is the positioning and organization of students and the teacher in the lesson; in practice, organizing students in group forms has been found effective. There are three main ways to organize work within a group:

a) using study cards,

b) via a group leader,

c) through independent work.

For example, E.I. Volcheskiy suggests using study cards. These cards contain tasks that allow each student to perform only the movement necessary for them. Although each card does not ensure an individual approach to the student, the author suggests composing it in a universalized version. That is, the tasks on the card contain different options for students of various levels. Thus, students of different ages and levels of motor preparedness can use a single card [1].

Study cards should include the following:

theoretical information;

means for mastering movement technique;

means for developing physical qualities;

Furthermore, they should serve to increase the student's potential for independent decision-making when performing tasks.

The card-based teaching method helps organize the educational process in a creative, student-centered, and adapted manner.

The content of an individual study card is based on a specific motor activity. It is well known that many basic movements in the general education curriculum are taught repeatedly across different grades; however, their complexity increases annually, and the requirements regarding students' physical fitness are raised in each grade. Therefore, if a student has not fully mastered a specific movement in the previous grade, they will not be ready to perform the more complex exercise at the next stage.

The establishment of effective communication between the teacher and the student depends largely on the form of lesson organization. In command-based frontal instruction, the teacher is constantly occupied with issuing commands and cannot find time for individual interaction. They can only indicate attention to a student through a glance or gesture, mention general errors, or highlight the 2–3 best or worst results.

Genuine individual interaction is possible only when the teacher delegates some of their functions to the students. This is realized through the principles of group or individual lessons. In this context, each small group or even an individual student receives an oral or written assignment; while performing the task, they independently determine the pace of work and the number of repetitions, analyze their movements, and request assistance from the teacher if necessary. The teacher, without spending time issuing commands, moves freely across the field and is able to work directly with students who require assistance at that moment. This drastically increases the effectiveness of education and allows for the selection of an individual approach to form specific motor skills and abilities for each student.

In the process of integrating the differentiated approach into the physical education system, it is proposed that the assessment of students' performance results be carried out in the following order: the level of execution of movement technique is assessed in accordance with criteria developed based on the students' level of preparedness (weakly or strongly prepared

groups).

A dual approach is applied in determining the dynamics of physical fitness: 1.Analyzing scores through special assessment tables; 2.Measuring the rates of improvement in results. At the same time, criteria have been proposed for assessing students' competence in independently carrying out physical activities related to a healthy lifestyle.

Conclusion. The theoretical analyses conducted indicate that it is necessary to use differentiated and individualized approaches to effectively organize physical education lessons in general secondary schools. Organizing classes based on existing scientific studies, methodological developments, and experimental models - while taking into account the students' levels of physical, psychological, and motor preparedness - serves to create an educational system adapted to their developmental needs.

The analyzed approaches demonstrate that physical education effectiveness can be increased by grouping students according to their physical fitness level, ability to master movements, and temperament; by differentiating tasks; and by adapting assessment criteria to the dynamics of personal development. Furthermore, tools such as game methodology, programmed instruction, and study cards expand the possibility of applying an individual approach.

These conclusions serve as a theoretical-methodological basis for improving the differentiated physical education system, maximizing the realization of each student's potential, and forming a healthy lifestyle.

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