



PEDAGOGICAL CONDITIONS FOR THE FORMATION OF STUDENTS' MOVEMENT COORDINATION PROCESS

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Abstract

This article discusses the pedagogical foundations of the formation of coordination of movements in students, its role and importance in the process of physical development. The system of exercises aimed at developing coordination of movements in the process of physical education classes, effective methods of their application in the lesson, and the impact of properly organized pedagogical conditions on the accuracy of movements and general physical fitness of students are analyzed. The results of the study show that the development of coordination of movements increases the effectiveness of physical education classes and is an important factor in the formation of physical activity and a healthy lifestyle of students.

Keywords: Coordination, space, motor, harmonization, static, dynamic, balance, rhythm, speed, individual, vegetative, muscle, agility, flexibility.

Introduction

Today, one of the key tasks of the education system is to ensure students' physical development, promote a healthy lifestyle, and improve their motor activity. In particular, the development of movement coordination in students plays a significant role in their physical fitness, agility, and overall development. Movement coordination reflects students' ability to perform various movements accurately, quickly, and harmoniously. The process of developing this quality can be effective only when it is organized on the basis of specific pedagogical conditions. Therefore, the pedagogical conditions for the formation of students' movement coordination are among the important factors determining the effectiveness of physical education and sports training sessions.



Literature Review and Methodology:

In many scientific studies, coordination abilities are considered a primary function of motor development in preschool children. E. N. Vavilova and E. S. Vilchkovskiy note that coordination abilities begin to actively manifest during preschool age. However, in order to improve them, it is important to incorporate movement skills into the content of motor activity.

The structure of motor actions has been reflected in the works of various researchers such as V. K. Balsevich, N. A. Bernshteyn, Yu. D. Zheleznyak, L. P. Matveev, I. M. Turevskoy, V. P. Filin, N. A. Fomin, and V. I. Lyakh, who emphasized that these abilities develop during school age.

Taking into account students' individual and age-related characteristics is essential. Many educators have stressed the necessity of thoroughly studying and properly considering children's age and individual characteristics in the process of education and upbringing. These issues were particularly raised by Jan Amos Comenius, John Locke, Jean-Jacques Rousseau, and later by Konstantin Ushinsky and Leo Tolstoy.

Discussion:

Movement coordination is a person's ability to perform various movements accurately, harmoniously, and effectively in terms of space and time. It is closely connected with the activity of the central nervous system and ensures the coordinated functioning of muscles. Coordination abilities play a highly important role.

Coordination (from the Latin *coordinatio* — ordering or arranging) is the process of harmonizing the activity of body muscles aimed at successfully performing a motor task. During the development of motor skills, motor coordination undergoes changes. Initially, it is achieved through the active static fixation of moving organs; later, through short physical impulses directed to specific muscles at the right time. Finally, at the last stages of skill development, inertial movements emerge, which are now purposefully directed toward solving motor tasks.

In students, movement coordination consists of the following components:

- movement accuracy;
- maintaining balance;



- rapid adaptability;
- rhythm and movement harmony.

These qualities play an important role in students' daily life, sports activities, and the educational process.

The Importance of Developing Movement Coordination in Students

- ensures students' physical development;
- helps achieve high results in sports training;
- develops agility, dexterity, and speed qualities;
- reduces the risk of injuries.

Main Objectives of Developing Coordination Skills

In the development of coordination skills, two groups of objectives are considered:

- a) comprehensive development;
- b) targeted development.

The first group of objectives is mainly addressed in students' general physical education. The overall level of coordination skills achieved at this stage creates broad opportunities for the further improvement of motor skills.

When planning tools, methods, and targeted activities for developing coordination skills in 8–9-year-old students, it is necessary to take into account age-related patterns of physical development, the stages of higher nervous system development, as well as the interaction of vegetative and muscular systems during physical exercise.

The objectives of further and more specific development of coordination skills are considered in sports training and professional-applied physical preparation. In the first case, the requirements are determined by the specific characteristics of the chosen sport.

In sports where competitions are focused on movement technique—such as rhythmic and artistic gymnastics, figure skating, diving, and others—the ability to create new and increasingly complex forms of movement is of primary importance. It is also essential to differentiate movement amplitude and timing across various body parts, as well as to regulate muscle tension in different muscle groups.



Coordination skills develop rapidly during school age; therefore, it is important to organize training properly during this period. Students' age, level of physical development, health status, and preparedness are key factors in the pedagogical process. Selecting appropriate workloads and exercises for each student contributes to the effective development of coordination.

Motor exercises should be presented progressively, from simple to complex. First, simple coordination exercises are taught, followed by more complex and combined movements. This approach helps strengthen students' motor skills.

A wide range of abilities related to movement coordination can be conditionally divided into three groups:

1. **First group:** The ability to accurately measure and regulate spatial, temporal, and dynamic parameters of movement.
2. **Second group:** The ability to maintain static (postural) and dynamic balance.
3. **Third group:** The ability to perform movements without excessive muscle tension (stiffness).

The coordination abilities classified in the first group are associated with the "sense of space," "sense of time," and "muscle sense," that is, the perception of exerted effort.

The coordination abilities of the second group are related to maintaining a stable body position, that is, balance, which includes stability in static positions and balance control during movement.

The coordination abilities of the third group can be divided into the regulation of tonic tension and coordination tension. The first is characterized by excessive tension in the muscles responsible for maintaining posture. The second is manifested in stiffness of movements associated with excessive muscle contraction, overinvolvement of different muscle groups—especially antagonist muscles—and incomplete transition from the contraction phase to the relaxation phase, which hinders the development of perfect technique.

Main Objectives of Coordination Skills Development:

In developing coordination skills, two groups of objectives are considered:

- a) comprehensive development;
- b) targeted development.



The first group of objectives is mainly addressed in students' general physical education. The overall level of coordination skills achieved at this stage creates broad conditions for the further improvement of motor skills.

The development of coordination skills is also highly specialized in professional and applied physical training. Under the influence of scientific and technological progress, many existing and newly emerging types of practical activities do not require significant muscular strength. However, they place high demands on the human central nervous system—particularly on the mechanisms of movement coordination—as well as on the functions of motor, visual, and other sensory systems.

Variety in Motor Activity

- increases students' interest;
- develops the neuromuscular system;
- teaches students to perform movements quickly and accurately.

Using a variety of exercises provides greater effectiveness than simply repeating the same exercises.

- Exercises should be selected according to students' age, level of physical development, health condition, and preparedness.
- Movement coordination develops especially rapidly during primary and middle school age; therefore, it is important to ensure diversity in exercises at this stage.

A Set of Exercises for Developing Movement Coordination

The following exercises can be effectively applied during lessons:

- maintaining balance while standing on one leg;
- bouncing, catching, and passing a ball;
- jumps (forward, backward, and sideways);
- obstacle-crossing exercises;
- rhythmic movements (exercises performed to music).

These exercises develop students' movement accuracy, balance, and agility.

Movement coordination is the precise harmonization of all individual muscles that make up a student's body, which ensures that all our movements are smooth, flexible, measured, and economical, without showing signs of mechanical conflict between opposing (antagonistic) muscles.

Coordination abilities should primarily be understood as:

1. the capacity to purposefully organize motor actions;
2. the ability to adapt or transition movements according to changing conditions, creating more advanced forms of movement or shifting from one movement to another.

A person's coordination abilities play a crucial role in controlling movements—that is, in harmonizing and regulating diverse motor actions to perform a given task as a unified whole.

Creating Favorable Pedagogical Conditions

- A positive psychological environment, encouragement, and support increase students' active participation.
- Teaching students not to fear mistakes helps them perform coordinated movements more freely.
- It is necessary to regularly monitor and assess students' developmental progress.
- Working on mistakes and providing individual recommendations enhances effectiveness.

Methods for Developing Movement Coordination

The following pedagogical methods are considered effective for developing movement coordination in students:

1. Repetitive Exercise Method

- In this method, the same movements are performed multiple times.
- Repetition helps develop movement accuracy and harmony.

2. Variable Conditions Method

- Performing exercises at different speeds, directions, and conditions improves students' adaptability.

3. Game Method

- Through active games, students perform exercises with interest.
- This method is especially effective for younger children.



4. Competition Method

- Incorporating elements of competition increases students' engagement, teaches quick decision-making, and improves movement precision.

Criteria for Assessing Movement Coordination

Students' movement coordination is assessed based on the following criteria:

- accuracy and correctness of movement;
- ability to maintain balance;
- speed and harmony of movements;
- level of independent performance of exercises.

Based on assessment results, the teacher determines an individual approach for each student.

Pedagogical Experiment (Sample)

The experiment was conducted with two groups:

- **Control group** – performed traditional exercises;
- **Experimental group** – performed specialized coordination exercises.

The results of the experiment showed that students in the experimental group demonstrated significantly higher levels of movement accuracy and balance.

Conclusion

In conclusion, the process of developing movement coordination is effective only when carried out under properly organized pedagogical conditions. This process is one of the key objectives of physical education, as it promotes students' physical development, movement accuracy, and the ability to control their own movements.

The reason is that physical education classes significantly influence students' coordination abilities, which simultaneously have a notable impact on their intellectual development.

The formation of movement coordination in students is an essential component of the physical education process. For this process to be effective, it is necessary to consider age and individual characteristics, organize lessons systematically and consistently, ensure variety in motor activity, and create a supportive pedagogical environment.



Properly structured pedagogical conditions develop students' movement abilities and contribute to the formation of a healthy and active lifestyle.

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