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**Annotation.** *This article examines the methodological foundations for organizing and improving physical education classes for students with visual impairments within an inclusive educational environment. The study highlights the relevance of adapting physical education programs in accordance with modern inclusive education principles and international standards established by the United Nations Convention on the Rights of Persons with Disabilities, as well as national policy reforms in Uzbekistan.*

*The paper analyzes the types of visual impairments and their impact on motor development, balance, coordination, spatial orientation, and psychological well-being. It identifies the shortcomings of traditional physical education approaches in general schools, including insufficient adaptation, safety risks, reduced motivation, and the emergence of secondary complications such as hypodynamia and postural disorders.*

*Based on the principles of Universal Design for Learning (UDL) and adaptive physical education, the article proposes an improved methodology that emphasizes individualization, safety, multisensory instruction, pre-teaching strategies, interdisciplinary collaboration, and the creation of a supportive motivational environment. Practical recommendations for structuring lessons, adapting sports activities, and ensuring effective participation are provided.*

**Keywords:** *Inclusive education; visual impairment; physical education; adaptive physical education; low vision; blindness; motor development; balance and coordination; multisensory learning; Universal Design for Learning (UDL); tiflopedagogy; individualized approach; safety in physical education; social integration.*

Organizing physical education classes effectively for students with visual impairments is one of the priority areas of the modern education system. Based on the principles of inclusive education, every child—regardless of health condition or individual developmental characteristics—has the right to active and full participation in the educational process. In this regard, improving physical education classes on a scientific basis for students with various levels of visual impairment has become an urgent issue. This direction is consistent with the principles of the Convention on the Rights of Persons with Disabilities adopted by the United Nations, and in our country, the development of inclusive education has become an important direction of state policy.





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In particular, the Resolution No. PQ-4860 on the development of inclusive education, adopted at the initiative of the President of the Republic of Uzbekistan, as well as regulatory documents aimed at improving the system of education for children with special educational needs, require the adaptation of physical education classes. Physical education is not only a means of strengthening the body but also an important factor in socialization, psychological stability, and the formation of independent life skills.

Visual impairments manifest in various forms and directly affect a child's physical development. They can be conditionally divided into primary and secondary consequences. Primary impairments are related to anatomical or functional damage to the eye, while secondary consequences appear in the form of delays in motor development, spatial orientation difficulties, balance disorders, and psychological barriers.

In cases of low vision, visual acuity typically ranges between 0.1 and 0.4. Such students can distinguish bright colors but have difficulty clearly seeing distant objects. As a result, they may make errors in activities such as catching a ball, aiming at a target, or estimating distance. In cases of blindness, vision is completely or almost completely absent. In such students, tactile (touch-based) and auditory perception becomes dominant; therefore, physical education classes should widely incorporate sound signals, tactile markings, and peer assistance.

Refractive errors—myopia (near-sightedness) and hyperopia (far-sightedness)—are common among school-aged children. These conditions negatively affect balance and coordination, reducing movement accuracy. Disorders such as strabismus, glaucoma, and retinal damage not only narrow the visual field but may also require limitations on intense physical exertion. For example, children with retinal problems are generally advised to avoid strong impacts, jumping, or exercises that increase head pressure.

Due to visual impairments, overall motor development in children may be delayed by 1–2 years compared to their peers. According to some studies, independent walking in blind children may develop around the age of 2–2.5 years. Weak balance, insufficient coordination, and underdeveloped spatial perception limit their motor activity. Additionally, fear of movement, low self-confidence, and social withdrawal negatively affect physical development. Improper posture (such as hunching or forward head position) is also common, increasing the risk of scoliosis and other postural disorders.

For this reason, improving physical education classes is essential. It is important to rely on the principles of adaptive pedagogy. Classes should be organized based on safety, individualization, gradual progression, and sensory compensation. Each exercise must be explained verbally in detail in advance and, when necessary, demonstrated through guided tactile instruction. The boundaries of the activity area should be clearly marked, and unnecessary obstacles must be removed.

Experience shows that properly organized physical education classes significantly improve balance and coordination in students with visual impairments, reduce fear, and enhance social activity. According to certain scientific observations, regular and adapted





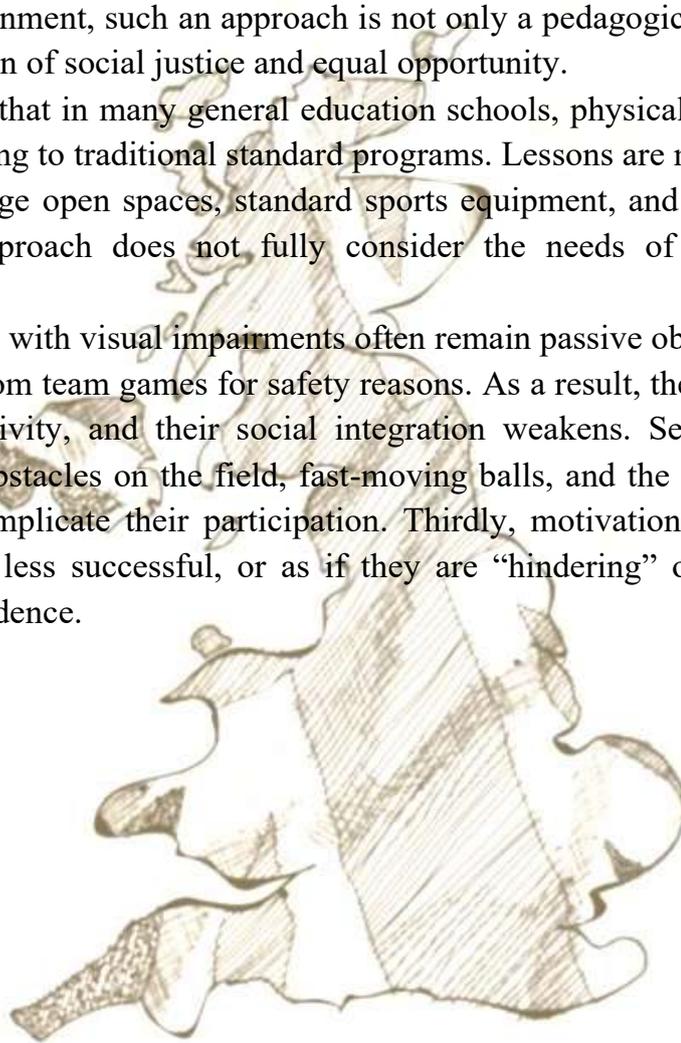
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training can reduce functional limitations by 30–50 percent. This contributes not only to physical development but also to improving the overall quality of life of the student.

In conclusion, organizing physical education classes for students with visual impairments requires not a standard programmatic approach but a scientifically grounded adaptive methodology that takes individual characteristics into account. In an inclusive educational environment, such an approach is not only a pedagogical necessity but also a practical expression of social justice and equal opportunity.

Practice shows that in many general education schools, physical education classes are conducted according to traditional standard programs. Lessons are mainly based on visual demonstration, large open spaces, standard sports equipment, and identical tasks for all students. This approach does not fully consider the needs of students with visual impairments.

Firstly, students with visual impairments often remain passive observers during lessons or are excluded from team games for safety reasons. As a result, they cannot fully benefit from physical activity, and their social integration weakens. Secondly, safety-related issues—such as obstacles on the field, fast-moving balls, and the risk of collisions with peers—further complicate their participation. Thirdly, motivation decreases. A student may feel limited, less successful, or as if they are “hindering” others, which leads to reduced self-confidence.





## Vision Impairments

### Low Vision

Visual acuity typically ranges **0.1–0.4**. Can distinguish bright colors but have difficulty seeing distant objects clearly.



- Errors in catching a ball, aiming, estimating distance



- Errors in catching a ball, aiming, estimating distance

### Blindness

Vision is completely or almost completely absent. Tactile & auditory perception becomes dominant.



- Sound signals, tactile markings & peer assistance should be incorporated

### Refractive Errors

**Myopia (near-sightedness) & hyperopia (far-sightedness)** reduce balance & coordination, movement accuracy



- Strabismus, glaucoma, retinal damage narrow visual field, require limitations on intense physical exertion



Strabismus. Glaucoma Retinal damage

### Overall motor development delayed by 1–2 years



- Weak balance
- Fear of movement, low self-confidence & social withdrawal

Independent walking in blind children develops around 2–2.5 years old

- Weak balance
- Fear of movement, low self-confidence & social withdrawal
- Improper posture

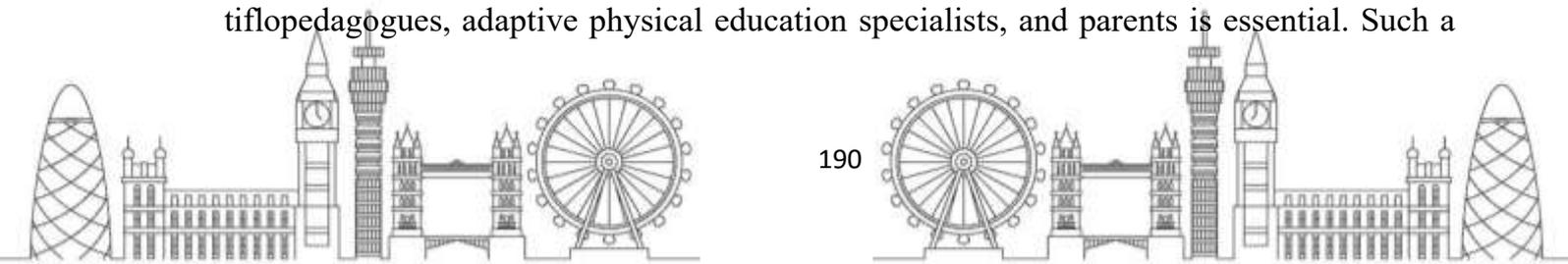
### Risks & Effects

- Scoliosis
- Delayed motor development
- Lack of coordination & spatial perception



In such conditions, adequate physical activity is not ensured, leading to secondary negative consequences such as hypodynamia, excess weight, postural disorders, social anxiety, and even depressive moods. Some international studies indicate that obesity rates among children with visual impairments are higher than among their peers, partly due to insufficiently adapted physical education classes.

Although the number of inclusive classrooms in Uzbekistan is increasing, the lack of specialized methodological materials and trained specialists still hinders the full resolution of this issue. Therefore, strengthening cooperation among physical education teachers, tiflopedagogues, adaptive physical education specialists, and parents is essential. Such a





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multidisciplinary approach makes it possible to develop an individual development program and create a safe and effective learning environment.

An improved methodology for working with students with visual impairments is based on modern pedagogical approaches, including Universal Design for Learning (UDL), inclusive education, and adaptive physical education principles. The main goal of this approach is to create an equal and accessible learning environment for all students.

First and foremost, an individualized approach is crucial. Each student's functional level of vision, medical diagnosis, ophthalmologist recommendations, and psychological characteristics must be taken into account. For example, exercises that increase intraocular pressure are limited for students with glaucoma, while jumping and high-impact movements are carefully controlled for those with retinal problems.

The second principle is ensuring safety. The activity area must be cleared of unnecessary objects, boundaries should be marked with tactile or bright visual indicators, and equipment must be placed at a safe distance. Students should be given time to become familiar with the environment in advance.

The third important principle is multisensory learning. Exercises should be explained not only visually but also through auditory (sound signals), tactile (hands-on guidance), and kinesthetic (movement-based awareness) channels. For example, placing a bell inside a ball or marking boundaries with textured tape can be effective.

Pre-teaching—introducing new material individually or in small groups in advance—is also important. Practicing with a tiflopedagogue before the main lesson allows the student to feel more confident during regular classes.

The principle of collaboration is equally significant. Close cooperation among the physical education teacher, tiflopedagogue, para-educator, parents, and a peer “buddy” strengthens the student's social adaptation. Performing exercises together with peers fosters teamwork and mutual respect.

In addition, creating a motivational environment is essential. Every small achievement should be recognized, positive feedback should be provided, and students should experience joy in movement. This enhances intrinsic motivation and independence.

For students with visual impairments, physical education classes are recommended three times per week, lasting 40–45 minutes each. Although the lesson traditionally consists of three parts, its content must be adapted.





## Main Part (25–30 minutes)

General developmental exercises: Posture, breathing, balance, eye muscle relaxation



Balance Exercise



Coordination



Spatial Orientation

### Adapted Sports Games:

#### Football

Ball with bell inside, marked field & guiding ropes



#### Basketball

Hoop with bright tape & auditory signal



#### Goalball

Blindfolded players rolling ball with bells



#### Dance & Gymnastics

Movement to music with tactile markers



#### Running

Using tether or hand-in-hand with guide runner



### Introductory Part (5–7 minutes)

The lesson begins with a brief health check and psychological preparation. Breathing exercises prepare the body for activity. Students are then introduced to the activity area by walking along tactile markers and learning basic directions (e.g., north–south). The lesson





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objectives and rules are explained verbally and through tactile description. For example, “The ball contains a bell and makes a sound when it moves.”

### Main Part (25–30 minutes)

During this phase, general developmental exercises are performed to improve posture, regulate breathing, and strengthen balance. Relaxation exercises for the eye muscles may also be included. Special exercises focus on balance (standing on one leg with support), coordination (catching a sound ball), and spatial orientation (walking in a designated direction).

Adapted sports games make the lesson particularly engaging. For example:

- Football — using a ball with a bell inside, a small and clearly marked field, and guiding ropes.
- Basketball — using a hoop marked with bright tape and an auditory signal device.
- Goalball — a team sport specifically designed for athletes with visual impairments, in which all participants wear blindfolds to ensure equal conditions.
- Dance and gymnastics — movements performed to music rhythm with tactile markers for orientation.
- Running — using a tether (a short connecting rope) or running hand-in-hand with a guide runner.

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