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HYGIENIC REQUIREMENTS FOR CLASSROOM FURNITURE

Annotation: The quality of education is closely related to the conditions in which students spend their time at school. One of the key aspects of comfort and health is the furniture used in classrooms. Hygienic requirements for classroom furniture mean that it must meet certain standards in order to provide students with a comfortable and safe learning environment.

Keywords: Classroom furniture, backrest distance, seat distance and differentiation.

Introductions. The primary purpose of classroom furniture is to provide a comfortable environment for students to sit and work for long periods of time. The ergonomic characteristics of the furniture, such as properly designed chairs and tables, should be appropriate for different age groups of students and maintain correct posture. This includes: Height adjustable: Chairs and tables should be able to be adjusted in height to match the height and size of the students, ensuring the correct body position. Ergonomic shapes: Furniture should have ergonomic shapes that support the natural curvature of the back and prevent overwork. Back and Lower Back Support: Chairs should provide back and lower back support to reduce muscle strain and reduce the risk of back pain. Safety and Durability In addition to comfort, classroom furniture should be safe and durable. This is important to prevent injury and ensure a long service life of the furniture. Key aspects in this regard include: Stability: Chairs and tables must be stable and stable to prevent them from tipping over. Safe materials: Furniture must be made of environmentally friendly materials that do not contain harmful substances or sharp edges that can cause injury. Robust structures: Furniture designs must be durable and reliable to withstand everyday use and not be subject to rapid wear. Convenience in care and hygiene Classroom furniture should also be easy to maintain and ensure high hygiene standards. This includes: Ease of cleaning: Furniture should be easy to care for and kept clean with minimal effort. Antibacterial properties: Furniture surfaces must have an antibacterial coating or be made of materials resistant to the development of bacteria and microorganisms. Pollution resistance: Furniture should be resistant to stains and dirt, which will make it easier to care for and maintain cleanliness in the learning environment.

One of the main requirements for furniture (desks, tables, chairs) is the correct ratio of the main elements of the table and chair, which is normalized by the values of the backrest distance, seat distance and trim.

The backrest distance is the distance (horizontally) from the back edge of the desk lid to the back of the seat — corresponds to the anterior-posterior size of the student's torso plus 3 — 5 cm. With the correct distance of the backrest, a distance equal to the width of the student's palm remains between the edge of the desk and the student's chest. If the distance of the backrest is overestimated, the student cannot lean on the back of the desk while reading and writing, he gets tired quickly and has to lean his chest on the edge of the desk to maintain the trunk. Such an incorrect posture leads to compression of the chest, promotes curvature of the spine, shortens the onset of fatigue and reduces the distance between the eyes and the work surface. If the back

distance is too small, the student finds himself trapped between the table and the back of the chair, his breathing and blood circulation are disrupted, the working position becomes uncomfortable, the static load increases, fatigue increases, and performance decreases.

Seat (bench) distance is the distance from the edge of the seat to the vertical lowered from the edge of the table facing the student. There are negative, zero and positive seat distances.

The negative seat distance is considered to be such that the perpendicular lowered from the edge of the table will fall on the seat 4-5 cm at small and 6-8 cm at large sizes of student furniture from its edge, i.e. when the seat goes 4-5 or 6-8 cm under the edge of the table. The negative seat distance is in full accordance with the backrest distance, meets hygienic requirements and ensures a comfortable and least tiring fit during work. The presence of a negative seat distance makes it possible to firmly support the back of the chair when writing, reading and eliminates the possibility of curvature of the spine, as well as visual impairment.

A zero seat distance is one in which the back edge of the desk or table lid and the edge of the seat are on the same vertical or, in other words, when the perpendicular lowered from the edge of the table falls directly onto the edge of the seat. A zero seat distance is less desirable.

The positive seat distance is the distance at which there is a distance between the edge of the seat and the perpendicular lowered from the edge of the desk, or, in other words, when the perpendicular, the distance of the desk seat: A—negative; B-zero; C-positive lowered from the edge of the table cover, falls into the free space in front of the seat. Such a distance does not meet hygienic requirements, it does not ensure a proper fit; In such a case, a student cannot lean on the back of the seat when writing or reading, he moves to the edge of the bench, which leads to the same consequences as with an excessively long back distance.

The difference is the vertical distance from the surface of the table cover to the seat, i.e. it is the height of the table above the seat. Differentiation among all sizes of school furniture, which significantly affect the formation of the working posture, physiological and ergonomic indicators, occupies an important place. It is customary to determine the difference based on the height of the elbow of the lowered arm of a sitting person above the plane of the seat. The correct differentiation is considered when it corresponds to the distance from the seat to the elbow point of the arm plus 5-6 cm. If the differentiation of the table or desk is less than the set value, then the student is forced to bend over strongly, which makes it difficult to breathe and eliminates the possibility of the student sitting correctly at the desk, thereby causing rapid fatigue. In addition, the student is forced to lower his right shoulder strongly, which entails bending the spine to the left and the formation of left-sided scoliosis. If the differentiation of the desk or table exceeds the set value, which is noted with excessive height of the table and a low seat, then the student has to significantly lift his right shoulder, and this can lead to the formation of right-sided scoliosis.

The most important requirement for classroom furniture is an inclined table cover. When reading, the inclined position of the lid reduces the visual load, as the angle of view from which each visual object is perceived increases. The best visibility conditions are achieved if the plane of the object and the line of sight are mutually perpendicular. Under this condition, the visual object, in particular the book, and therefore each letter, is perceived from the greatest angle of view. With the horizontal position of the table cover and the book or notebook lying on it, the student, instinctively striving to create a mutual perpendicular to its plane and line of sight, tilts his head. In this case, the center of gravity of the head is in front of the fulcrum; to overcome gravity, the cervical and occipital muscles are strained, which contributes to the early onset of fatigue.

The distance from the eyes to the book at the horizontal and inclined tables (with a stand)When the book is horizontal, the distance from the eyes to the upper and lower edges of the book is different. So, if we take the distance from the eyes to the bottom edge of the book to be 350 mm, and the height of the book to be 200 mm, then a simple trigonometric construction can determine the distance from the eyes to the top line of the book. It will be equal to 431 mm. In other words, the difference in distance from the eyes to the upper and lower edges of the book is 431 — 350 = 81 mm. Such a difference also requires a difference in accommodation. Therefore, when reading each page, there is a change of accommodation, tiring for the eyes.

When the book is tilted, if the book lies at an angle of 45 °, the distance from the eyes to both edges of the book is approximately equal (349 and 350 mm) and a tedious change of accommodation for the eye when moving the eyes along the page is not required.

A study of the functional state of the muscles of the students' hands when writing at a table with horizontal and inclined covers showed that with an inclined lid, fatigue is somewhat less and occurs at a later date. All this makes it necessary to recommend an inclined lid for school desks. The need in some cases (manual labor, biology classes, etc.) for a horizontal lid causes the need for such a design of school tables that would allow the lids to be either inclined or horizontal.

The nature of the landing, its stability and convenience are largely influenced by the size of the individual elements of the table and chair. One of the most important functional dimensions of educational furniture is the height of the seat, which mainly affects the position of the legs and the inclination of the trunk in relation to the hip. With low chairs, the posture prevails when the angle of flexion in the hip joint is less than 90 °. When using high chairs, the angles in all joints (hip and ankle joints) are also less than 90°. In addition, there is a forward slide and, as a secondary phenomenon, a tilt in the pelvic region. With high and low seats, students complain of posture instability, a feeling of pressure in the area of the sciatic tubercles (with a low chair) and in the lower part of the hips (with a high chair). Studies have shown that the most acceptable seat height for work stools is the height corresponding to the length of the shin with the foot in the shoe.

For the convenience of the pose, the shape of the seat and its tilt are essential. For training sessions at a table or at a desk, it is most rational to use horizontal seats or seats with a slight (2-3°) tilt back. Such seats allow for a great opportunity to change the position. The seat depth (front-rear size) is provided for at least 2/w or no more than 1/4 hip length. If the seat depth is greater, then the student's blood vessels and nerves of the popliteal cavity will be compressed. If the depth is lower, it will be difficult for the student to occupy a stable position and he will move off the bench.

To prevent early fatigue and reduce the tension of the back muscles when working at the student's desk, additional support for the trunk is of great importance. Each bench (chair) should have a profiled lumbosacral and lumbosacral back, not reaching 2-3 cm to the corners of the shoulder blades. Backs of this design contribute to the formation of a pose with a lower inclination, give reliable support to the body in the lumbar region and do not prevent a change in body position and its deviation back at the moment of rest.

It is essential to finish the surface of desks, student tables and chairs, which should be smooth, clean, without burrs, potholes, splinters. Classroom furniture is made of low thermal conductivity materials with high strength. To ensure better lighting of the classroom, desks are painted in light colors: the covers are light green, and the sides and seats are white or in the color of natural wood. To prevent glare, desks should not be covered with shiny varnishes.

Conclusion. Hygienic requirements for classroom furniture play an important role in creating a supportive learning environment that promotes the health, comfort and success of students. Properly designed and selected furniture can significantly improve the quality of education and the well-being of the school community.

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