



A Complex of Tools for Teaching Biology in Various General Educational Institutions

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ABSTRACT

This article describes the complex of biology teaching tools in various educational institutions. In addition, the use of computer and information technologies in biology lessons provides students with the opportunity to simulate biochemical processes occurring in living organisms, and other similar opportunities. Along with this, students will develop narrative skills, the ability to direct their knowledge and conclusions in the environment, draw conclusions from observations and experiments and diagnose primary information obtained in the laboratory.

Keywords:

Ergonomic, episodic technical, technological, ecological, laboratory, osteological, herbarium, taxidermic, entomological, pedagogical-ergonomic.

Introduction. Today, the environment in biology classrooms is experiencing structural changes, because classrooms are equipped from the point of view of interdisciplinary connection (that is, educational tools are equipped with Physics, Chemistry, ecology, referring to the commonality between academic disciplines and biology). As a result of this, a new approach to the solution of issues related to the subject in the field of biology is observed in students.

The use of computer and Information Technology in biology lessons provides educators with the ability to model and other similar possibilities of biochemical processes that take place in living organisms. At the same time, the skills of narration, the ability to direct their knowledge and conclusions in the environment, draw conclusions as a result of observations and experiments, and the skills of diagnosing primary data obtained in the laboratory will be formed in the students.

To achieve the above-mentioned results, biology training classes will have to be equipped based on modern requirements for teaching this subject. First of all, the methodology of teaching

biological science the study room is a complex consisting of two rooms, one of the rooms is intended for conducting a study audience, and the other for laboratory work. That is, the main task of this training room is to prepare the students methodically. The main requirements for the teaching methodology of the subject of biology for the study room are:

- Scientific and methodological requirements. According to these requirements, biology classrooms should cover the content and content of the subject and embody the theoretical, psychological and didactic aspects of education and education of students.

- Ergonomic (Organization of educational processes in moderate conditions), hygienic and technical safety requirements. This provides for the scientific and optimal organization of the teacher's activities.

- Technical, technological, environmental requirements. Equipment should be made of acceptable materials in terms of price, and simplicity and ease of use should be prioritized.

- Special students: in this it is necessary to take into account the specific aspects of the means of Education.

The methodology of teaching biology provides for filling in the organization of the equipment of the study room with a complete set of equipment and equipment required based on the content of educational processes.

The educational room should have a level design that can give positive emotions, inspiration, mood and interest to the participants in the educational process. At the same time, interior design is required to be relevant even when performing an educational task. The interior design of the study room is desirable to create biology based on the content of educational science, materials that directly or indirectly have a positive effect on the methodology of teaching biology. Objects and design tools that are constantly standing as interior decoration in the study room should give students a constant idea of the educational science of biology and the methodology of teaching this discipline.

Temporary and permanent exhibitions and design tools used in the creation of the interior design of the study room should be placed in such a way that it is used as part of educational tools in the process of studying biology. That is, texts, pictures, objects, pictures should stand within the framework of the eyes of each educational person.

Literature review. The following can be included in the permanent exhibitions of teaching biology methodology, which are used for the interior design of the study room:

1) Pictures of Uzbek scientists who have contributed to the development of Biological Science, as well as the methodologist-biologists who have developed the methodology of this science. J.O. Tolipova, A. T. Gafurov, D.Imamava, O. Portraits of Usanov and others, or replacing these portraits with slash "designer-biologists".

2) classification of teaching methods in biology.

3) the main problems of organizing a Biology study room.

4) the project of the school primary school room in the form in which the dimensions are indicated.

5) stages of giving order to the initial totals.

6) units of measurement used in Biological Science.

7) forms of manifestation of natural communities (forest, pasture, swamp, etc.).

Scientific novelty of the article. The placement of portraits of several biologist scientists and biologists-designers as the main elements of permanent visual design also gives a good effect.

Some tools with an episodic character can be placed outside the study room – in the walls of the corridor adjacent to the study room.

In accordance with the chosen level of teaching biology, the following several options for equipping study rooms are offered:

-for the initial level of study of biology, the study room will consist of two parts: a classroom and a laboratory assistant room;

- For prefabricated courses organized in Grades 5-7, the Natural Science Study Room will consist of two parts: a laboratory classroom and a laboratory assistant room equipped with additional equipment;

-for 8-11 classes of schools in which socio-humanitarian disciplines will be deepened, the biology training room will consist of one or two classrooms;

- it is achieved that there are 4 rooms within the Biology study room of schools in which Natural Sciences, in particular biology, will be deepened: laboratory room, laboratory room and 2 more rooms for living learning facilities;

- in biological practice institutions that study biology in the field of Science, the biology laboratory consists of two parts: a laboratory and a preparatory room.

Analysis and results. The creation of the material base of education and the optimal placement of equipment largely depend on the increased interest in knowing the subject of biology, as well as on the mastery of knowledge and skills in this field of science.

The Biology study room is not considered perfectly equipped without special furniture. The composition of special furniture includes the place of students, the furniture of the teacher, furniture and technical means for

various equipment and equipment. In the modern educational system, the experience of automating the teacher's place of work has gained wide popularity.

Biology teaching aids can be divided into two groups: basic tools and auxiliary mediator. The main tools for teaching biology include real (real), verbal (verbal), emblematic and informative tools. And auxiliary tools can include technical means of training, laboratory and excursion equipment.

Among the technical means of teaching biology, audiovisual means are important, including means of screen static projection (diaphragms, diapositives, slides).

Special pedagogical-ergonomic students, which are put on natural means of teaching (herbariums, namchil preparations, taxidermic and entomological assemblies:

- natural remedy to be common;
- the dried appearance of a herbarium plant or herb, the preservation of external signs of a separate part of it (leaves, stems, seeds and the like;
- that each sample of the herbarium has its own name and ordinal number;
- methodical instructions and assignments on the use of each herbarium are attached to the base of this herbarium;
- namchil preparations-zoological and anatomical preparations should be stored in transparent containers, have a label about their properties and properties, as well as methodological instructions for their use;
- the micropreparations are presented in the form of a structured complex for each department of the biology course and methodological recommendations are attached to each of these complexes;
- in these methodological recommendations, the image of microobjects and the annexation of tasks for the use of this microobject in independent work by educators;
- osteological preparations, that is, the ostigurma (skeleton) of different animals or the order-based accumulations of bones, are marked with a clear number, giving a label containing methodological instructions and assignments on the use of each skeleton (or complex of bones) in training;

- taxidermic materials include amulets of various animals, artificial forms with preserved appearance, and these artificial objects also include a specific order number, methodological instructions for its use and assignments.

-the composition of the collection is required to include the most common representatives of fish, birds, mammals.

-another of the most important requirements is that the collection should be stored in closed boxes or in a tight-fitting closet;

- Entomological collection-contains artificial copies of the most common representatives of insects, spiders, crustaceans, and they are stored in boxes with transparent glass.

Special pedagogical-ergonomic requirements for models:

- According to the methods of presentation to educators, models are divided into demonstration and distribution models. It is recommended that the models be made in convenient erasures and similar to the natural color of the original. The model should be accompanied by an explanatory text on the order of construction, instructions for storage, assembly, as well as methodological recommendations regarding its application in lesson sessions;
- artificial object, equal in size to the original of the object, retains all its texture and properties, and provides a complete and perfect study of the object: by making an artificial object, conditionality and exceptions are not allowed;
- layout-a reduced and simplified copy of the hajman, made to a certain extent, following the exact scale of natural objects;
- the model is a collection consisting of tablets consisting of words and images and is intended for the study of a particular object, process or phenomenon.

Special pedagogical-ergonomic students who are put on teaching instruments:

Educational instruments are a means of teaching in the form of technical devices and serve to carry out the control, measurement and management necessary for the study of phenomena, processes and laws. According to the field of use, educational instruments are

divided into autonomous, basic, as well as demonstrative and laboratory instruments.

Special pedagogical-ergonomic requirements for screen-sound means of teaching:

The duration of radio broadcasts on the topic of training should not exceed 20 minutes in small classes and 25 minutes in middle and upper classes.

Films on the topic can consist of a separate film or a shot inside a specific film. In this case, it is necessary to achieve that the duration of the film does not exceed 10 minutes, and the duration of the kinolavha does not exceed 3-5 minutes.

The learning diapositive (photolavha reduced to transparent picture paper) is an image reflected in the film, the study of the subject is placed on the basis of the order in which the logical sequence, consistency and duration of the study are taken into account. The educational diapositive consists of a picture and a text, in which it is not advisable for the image to be colorful and complex (so as not to exhaust the educational person and distract from the subject circle), but also the size of the letters for easy reading of the text should also be necessary and at an acceptable level. Explanatory text and methodological recommendations are attached to the system of diapositives.

Banners are an image displayed on a transparent film and are moved to the screen using a graphoprojector. The number of colors used to create the banner should not exceed 5. Banners are displayed in sequence and consistency, defined by methodological recommendations.

This set of educational equipment developed allows students to effectively and optimally plan the use of educational time in mastering a particular subject in biological science.

Conclusion. In the course of these studies, the methodology of teaching biology was developed a set of educational equipment for the study room and the corner of living nature, and a complex of specialized equipment was developed for the teaching room of biology (appendix 12). The developed set of teaching

tools makes it possible for students to understand and perceive the fundamental importance of the entire complex, developed on the basis of pedagogical and ergonomic requirements.

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