

APPLICATION OF INTERACTIVE METHODS IN THE TEACHING OF "MEDICAL ELECTRONICS" SUBJECTS IN HIGHER EDUCATIONAL INSTITUTIONS

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ABSTRACT

This article analyzes issues related to the use of interactive teaching methods in teaching medical electronics in higher education institutions. General information about the interactive educational activities of students is given in the lessons, i. e. , in lectures, practical, laboratory and seminar sessions. In particular, the educational activity of students is based on the principles of a fundamental conceptual approach, such as the "student-teacher" scientific-research relationship. The development of any field, of course, depends more on the specialist of that field. A specialist must have deep knowledge. In the effective organization of the process of teaching students in higher education institutions, the training of good specialists and mature personnel in this field is achieved as a result of the use of modern pedagogical technologies in personnel training.

KEYWORDS

Interactive methods, effective organization of the educational process, modern pedagogical technologies, effective thinking activity, formation of interest, motivation, teaching the science of medical electronics.

INTRODUCTION

Informatization is considered one of the main trends of the modern education system, and it is mainly

related to the introduction of various media methods that encourage its organization and optimization in



educational processes. The information field of higher education is the interaction of all its structures designed to improve the efficiency and conditions of institutions in general and the medical institution in particular and to increase the quality of the educational process. However, it is not possible to activate students' independence only by increasing their motivation of students, introducing multimedia educational tools, and mastering the material, but it is also necessary to correctly form the multifaceted skills of the future specialist.

Taking this into account, there is a need to determine the optimal forms of teaching methods and practices based on an individual and differential approach to students. There are many innovative teaching methods, one of which is interactive learning.

The developmental educational paradigm is person-oriented, its organization is interactive enables the active introduction of methods and forms and forms and develops the student's learning knowledge, effective thinking activity and interest.

The use of interactive methods of teaching medical electronics in higher education institutions training medical specialists can be used to produce highly qualified specialists.

METHODOLOGY

The involvement of interactive methods of teaching in the educational process forms the active learning and knowledge, skills and competencies of students. According to GM Gazizova, these methods are particularly effective in teaching medical sciences: they ensure student activity, that is, active participation in the educational process; based on experience; relies on needs and personal motivation, show respect for students; create friendly relations [1].

A. A. Verbitsky thinks that the student's training position and place in the activity, the more diverse it is, the better the future professional, i. e. the person will develop, the teaching is formed, and the creative approach to teaching is a meaningful activity, flexibility develops, learns to think more deeply. The study of interactive methods in the educational process is primarily related to the quality of training of highly qualified specialists [2].

Effective methods of teaching medical electronics;

1. Mini-lecture. This is one of the effective forms of presenting theoretical material. Before announcing any information, the teacher asks what the students know about it. After presenting any statement, the teacher invites students to discuss their reactions to the issue. For example, if we look at the example of the topic "Amplification of bioelectrical signals", before starting the presentation, the teacher addresses the students about the topic, asks about the amplification factor of the amplifier, the amplitude characteristic of the amplifier, the amplitude characteristic of the amplifier, transistor amplifiers. Students describe what they know.

2. Problem lecture. In the beginning, in the process of presenting the teacher and educational material, he creates problem situations and involves students in their analysis. By solving the contradictions that exist in problem situations, students can independently come to conclusions that the teacher should inform as new tasks. Problem lectures to ensure creative assimilation of the principles and laws of medical electronics by future specialists; to strengthen students' educational and knowledge activities, their independent work in the classroom and outside the classroom, learning and practising their application.



Figure 1. Special medical techniques.

In medical electronics lectures, students are taught the topics "The subject of medical technology and its structure", "Medical electronic devices and their main groups", and "Types and working principles of diagnostic devices, their possibilities and rules of use" problematic lectures are given (Fig. 1).

3. Lecture with planned mistakes (lecture-provocation). After announcing the topic of the lecture, the teacher reports what will be done in it, a certain number of errors of various types, that is, they are informative, methodological, behavioural, etc. At the end of the lecture, students should name the mistakes. The mistakes planned in the lecture with the role of professionals to quickly analyze professional situations developed by this lecture, develop speaking skills, distinguish true or false information, not only

stimulate the function should be encouraged as well as managed. In advance, the level of preparation of students for the subject can be assessed, and in turn, their level of direction in the material is checked. With the help of the error system, the teacher analyzes the errors while discussing them,

For example, in "Research of acoustic phenomena. He conveys and explains the topic of "auscultation" to students. If the frequency of waves propagating in the medium is between 20 Hz and 20,000 Hz, such waves are called sound waves or direct sound. Waves with a frequency less than 20 Hz are called infrasound, and waves with a frequency greater than 20,000 Hz are called ultrasound.

Table 1. A planned error with the wave frequencies switched

Infrasound	Sound	Ultrasound
>20000 Hz	20-20000 Hz	<20 Hz

4. Lecture visualization. This type of lecture was considered the result of a new use of the principle of

presentation in front of students. Lecture materials are prepared by the teacher with the help of presentation slides and multimedia.

If medical techniques, equipment and schemes students cannot imagine it is not explained through demonstration. For example, devices based on ultrasound waves (UZI) (Fig. 2), Computed tomography (MRT) (Fig. 3), diagnostic devices based

on X-rays (Fig. 4), electronic slides during the transition, etc. the use of multimedia guides comes in handy.

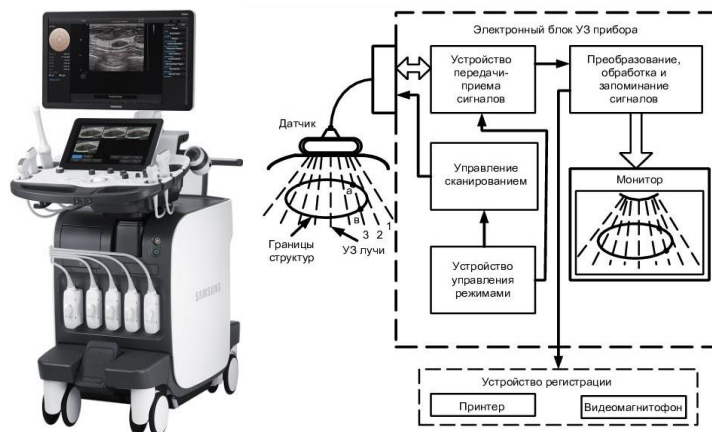


Figure 2. Diagnostic apparatus based on ultrasound waves (USW) and its block diagram

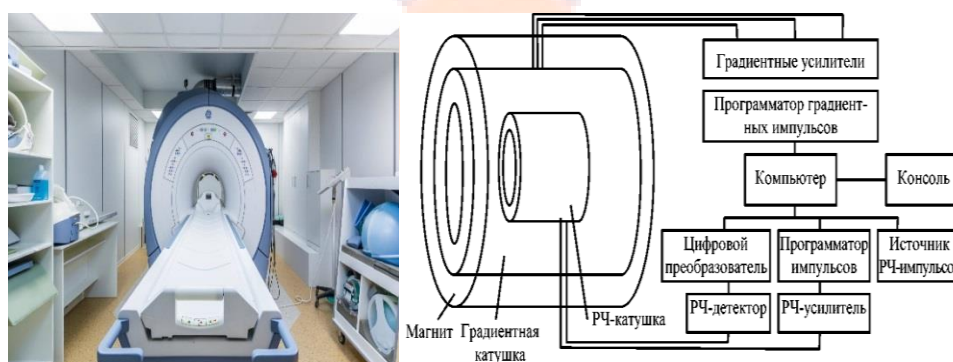


Figure 3. Computed tomography (MRT) and its block diagram.

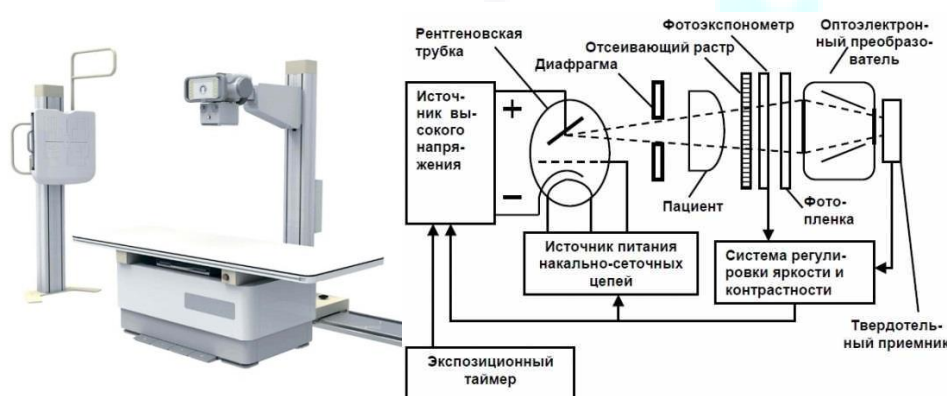
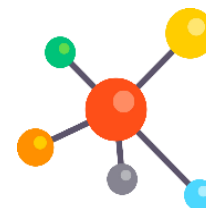


Figure 4. Diagnostic apparatus based on X-rays and its block diagram.



5. Lecture interview process, is a common form of active involvement of naive students in education compared to active students in the group. In this form of lecture, the teacher's communication with the audience is taken directly. The advantage of lecture dialogue is that allows students to focus on the most important aspects of the topic, and questions related to the topic, to determine the content and speed of presentation of the educational material, taking into account some features. The participation of the audience in the lecture conversation in different ways, be informative and problematic in nature, and questions and answers can be ensured by knowing the level of readiness of students to perceive information. For example, during the lecture on "Ultrasound research methods" topic, the teacher can address the students with the following questions:

- What is the average speed of sound in soft tissue?
- Explain the formula for the change in wave intensity.
- What are the devices that work based on ultrasound waves?
- Is it possible to use ultrasound equipment for non-diagnostic treatment?

Questions like the above are asked to the whole group of students and active students can answer from their seats. The teacher can ask the questions to several students or to the student himself. It is recommended to formulate questions as much as possible in the process of preparing for the lecture, thus saving time and giving clear answers.

RESULTS AND DISCUSSION

The principle of group discussion of the problems studied in the course of medical electronics is based on the round discussion method. The main purpose of such classes is to create an opportunity for students to use theoretical knowledge in practice in conditions that encourage professional activity. Such a lecture allows the professional skills of the future specialist to be formed.

Professional use of knowledge is the free acquisition of the language of science, fluency, rates, and clear actions with concepts.

The use of the above method in studying the course of medical electronics increases the motivation of medical electronics students for a deeper understanding of the studied physical phenomenon, increases their cognitive activity, obtains additional information on the topic, and encourages research, turning the study into a creative process. stimulates [3-6].

The higher education institution develops students' abilities as a basis for further professional activity. Education is up to standard lecture graduate or specialist who has mastered s should have the appropriate powers and professional skills [7,8]:

- Willingness to analyze and publicly display medical data based on evidence-based medicine;
- The ability to participate in scientific research;
- The desire to participate in the implementation of new methods and methods aimed at health care;

The active practical activity of students is a necessary condition that determines the effectiveness of the formation of these skills by students in the process of learning various subjects.

Actualization of students' practical activities is a complex task for educational structures of educational institutions. To solve this complex task and for private individual work of students, material and technical base, a sufficient number of technical tools and literature are necessary. In addition, the audience fund of educational structures of educational institutions should be permitted to organize practical educational activities in the institution [8].

To solve medical problems in higher education institutions, the conditions set by the state educational standard, and new conceptual approaches to its



organization are necessary. A conceptual approach that allows using the potential of the scientific-research methodology of fundamental sciences is offered as a basis for organizing practical educational activities for students, including studying the science of medical electronics.

Testing (approval) of the proposed concept is being tested by students of medical physics at the Faculty of Physics of UzMU named after M. Ulug'bek. Students use methodological instructions and materials prepared by the teachers of the department.

The perspective and potential of the presented conceptual approach are shown in the fact that the "student-teacher" scientific-research relationship helps students to be successful in their further scientific work [5].

CONCLUSION

In conclusion, it can be said that the above-mentioned interactive teaching methods allow, first of all, to implement the practice-oriented teaching concept, to better master the professions specified in the educational program. Conducting classes with interactive teaching methods develops knowledge related to the exchange of ideas, activates public works, and this is a necessary element in the formation of professional interests of future specialists. In the process of applying the interactive form and methods of teaching to the educational process, the motivation for teaching and learning increases, and a person-oriented teaching model is implemented.

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