

## DEVELOPMENT OF INNOVATIVE TECHNOLOGIES IN EDUCATION OF HIGHER MEDICAL STUDENTS

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### ABSTRACT

*The issues of staff training, the role of innovative technologies in medicine, the main aspects of their effective implementation, the use of CBL (Case Based Learning) technologies in medicine are highlighted. In addition, in the article students competence from physics practical exercises based on information important was one how many pedagogical technologies and their application methods. This is provided in the article in this subject education process interactive technologies, virtual laboratories and other innovative approaches based on organization to grow methodology analysis is made. Also, in the article approaches based on students practical-procedural competence development efficiency discussion will be done.*

**Keywords:** *problem-based learning, microscope, blood, erythrocyte, interference, biological sample, medical physics, medical technology, pedagogical activities, creative thinking, radiation safety, innovative technologies in medicine, CBL (Case Based Learning)-technologies*

### INTRODUCTION

The main goal of vocational education is to train qualified personnel who are competitive in the labor market, who know their profession well and are oriented to the relevant fields of activity, who strive for continuous professional growth, social and professional mobility. The main task of today is to acquire lifelong knowledge even after higher education. It is very important to create conditions for the development of requirements during higher education. It is known from psychology that the information received through vision is more meaningful and better stored in

memory. The best lectures and interesting information heard by students are absorbed by only 17%, and 50-70% of the information received by viewing remains in the long-term memory, and with repeated viewings it can reach 100%. In recent years, the increase in competition, characterized by socio-economic development, places sufficiently high demands on young specialists in the labor market. As a result, the requirements for graduates of higher education have increased to a certain extent. In addition to traditional teaching methods, new methods of teaching are widely used by students of educational institutions in medical clinical service courses. It makes no sense to train modern doctors with high competence without using innovative technologies that meet the requirements of practice and ensure the quality of their further work [1].

### **Research methodology.**

The applied educational technologies should be innovative. Innovation (see "Innovation") is an effectively implemented (applied) innovation. The term "innovation" comes from the Latin word "novato" which means to renew (change) and the suffix "in" translates as "in the direction of". Literally, "innovatio" means "changes in direction". Not just any innovation or newly introduced innovation, but only innovation that significantly increases the efficiency of an existing system is an innovation. Students - teachers / teachers - employers are participants of the process. Improving the efficiency of health care is, first of all, modernization of the system of training qualified medical personnel. Rapid changes in medical theory and practice require doctors to constantly improve their skills. The main direction of improving the process of improving the qualifications of doctors after higher education is the gradual introduction of modern forms of training. In the process of training, it is necessary to start with strengthening the specialist's self-development. Traditional teaching methods involve the transfer of information according to a specific algorithm in professional activity and their confirmation. Such an approach is relevant today in the training of doctors to provide medical care to the population. [3]. In recent decades, major changes can be observed in the training of students in the field of medicine: modeling of professional activity including problematic situations; new pedagogical technologies: problem-oriented teaching; teaching based on clinical situations; information and communication and computer technologies; training based on simulation technologies; project-based learning, etc. During this period, significant modernization works were carried out in medical higher education institutions, new approaches were formed, and new educational programs were developed with the main focus on simulation training. [2] The main method used in traditional teaching is illustrative-explanatory. There will be oral, written and mixed

surveys. Control in the form of a written survey is carried out in each seminar class, as well as in the final control. Test tasks are prepared by teachers for written control and updated by 25-30% every year. A mixed method of knowledge assessment is used for conducting intermediate and final controls.

There will be a written test and an oral examination on all the topics covered. Acquisition of theoretical knowledge by students has great complexity - they have at their disposal a large amount of books, articles, lectures, audio and video materials. Practical skill accumulation by medical students is carried out in the process of communicating with senior colleagues and repeating the actions they have seen. This takes a lot of time. Improper implementation of practical actions by the student can harm the patient. Therefore, it is necessary to obtain virtual simulators for the formation of practical skills in the diagnosis of the patient by OTM. Educational technologies should be innovative. Innovation is effectively applied innovation. Innovation is not just an introduced innovation, but a significant increase in the efficiency of an existing system.

#### **ANALYSIS AND RESULTS.**

Various technologies of information and data visualization are making great progress in the field of education. When information is presented along with a visual array, information absorption improves by almost 80%. Capillaroscopy is an innovative technology that provides information on the need to prevent vascular diseases and promotes a healthy lifestyle. Capillaroscopy is a microscopic examination of capillaries (175- and 400-times magnification).

Evaluation: 1. Structure of capillaries. Capillaries are nano objects, that is, the smallest vessels of the body. The average diameter of a capillary is 5-10 microns (the diameter of a red blood cell is about 7.5 microns). 2. Functions of capillaries. Capillary exchange channels. The main function of capillaries is the metabolism between tissues and blood flow: the arterial part of the capillary brings oxygen and nutrients to the tissues, and the venous part removes carbon dioxide and urea from the tissues. 3. Metabolism. In capillaroscopy, the tissue surrounding the capillary (perivascular zone) is visible. The computer capilloscope is designed for data viewing and parameterization (22 parameters). Among the innovative technologies that activate the educational process, it is possible to highlight the method of situational analysis, which includes the analysis of a specific situation. Today, the following methods are more commonly used in situational analysis: situational analysis (situational problems, situational exercises) method, case method, game design, role-playing method.

CBL (Case Based Learning) technologies are widely used in clinic departments. Technology develops a competent approach to diagnosis and treatment in the future doctor. In the CBL methodology, specific clinical situations and problem solving are considered, identification of symptoms and their integration into clinical syndromes, and identification of the leading syndrome are studied. For such technology, it is necessary to develop clinical situations, for example, the respiratory system, the cardiovascular system, the nervous system, the digestive system, etc. The advantages of the CBL method over the traditional method are: increased attendance, formation of a positive attitude to the teaching process, strengthening of long-term memory, motivation to study, improvement of problem-solving skills. The meaning of the method is that the student is not given ready-made knowledge, he must develop ways to solve the problem himself. CBL acts as a training supervisor in technology. Asks questions, supports the discussion, directs students to the goal when necessary, i.e. acts as a dispatcher. Descriptions of case-study technology: develop decision-making and problem-solving skills; helps connect theory and practice; increases the level of critical thinking; develops teamwork skills; helps to understand the difficulty of real situations; helps develop different views [3]. Before each lecture, the lecturer analyzes the clinical situation on the topic of the lecture. Then, together with the teacher, students learn to identify the clinical symptoms of the disease one by one, combine clinical symptoms, determine the leading syndrome, and determine changes in the results of the patient's laboratory-instrumental methods. At the end of the lecture, the teacher asks questions to see if the students have mastered the main points of the topic. In the process of conducting scientific research, students develop the skills of collecting materials and analyzing literature. They carry out a critical analysis of published works using bibliographic indexes, catalogs, and card files. In the process of conducting research, they acquire the skills of analyzing and processing materials, participating in discussions using statistical analysis and information technologies. The main methodological innovations are related to the use of interactive teaching methods. Interactive learning is based on teaching using computer networks and Internet numbers as a means of interaction or communication with something (computer) or someone (human).

### **CONCLUSION.**

Thus, applying modern teaching methods to the educational process allows students to master and develop clinical, team work, and research skills. Improving the efficiency of health care is, first of all, improving the system of professional training of medical workers. Everyone knows that it is very difficult to keep up with all modern scientific and technical achievements in the fast-changing, modern world.

But today it can be said that the Medical Academy is focused on the most advanced achievements of medicine, science and technology. In addition, it can be noted that employees have made great progress in their fields of activity.

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