USE OF FOREIGN ADVANCED EXPERIENCES IN TEACHING CLINICAL SCIENCES

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Annotation: *The article explores the development of clinical reasoning competencies in students through the application of advanced international educational methods such as Problem-Based Learning (PBL), Case Study analysis, Evidence-Based Medicine (EBM), Simulation-Based Learning, Telemedicine Training (remote clinical practice), anatomy and surgical training using Virtual Reality (VR), Interprofessional Education (IPE), and Gamification (game-based learning). The article highlights how these approaches can be effectively utilized to enhance clinical thinking among students.*

Keywords: *Problem-Based Learning (PBL), Case Study, Evidence-Based Medicine (EBM), Simulation-Based Learning, Telemedicine Training, Virtual Reality (VR) for anatomy and surgical training, Interprofessional Education (IPE), Gamification (game-based learning)*

Аннотация: *В статье рассматривается развитие компетенций клинического мышления у студентов посредством применения современных международных образовательных методов, таких как обучение на основе решения проблем (PBL), анализ клинических случаев, доказательная медицина (EBM), обучение с использованием симуляций, телемедицинская подготовка (удалённая клиническая практика), анатомическое и хирургическое обучение с применением виртуальной реальности (VR), межпрофессиональное образование (IPE) и геймификация (обучение в игровой форме). В статье подчёркивается, как эти подходы могут эффективно использоваться для улучшения клинического мышления у студентов.*

Ключевые слова: *обучение на основе решения проблем (PBL), анализ клинических случаев, доказательная медицина (EBM), обучение с использованием симуляций, телемедицинская подготовка, виртуальная реальность (VR) для анатомического и хирургического обучения, межпрофессиональное образование (IPE), геймификация (обучение в игровой форме).*

Annotatsiya: *Maqolada talabaldarda klinik fikrlash kompetensiyasini shakllantirishda "problem-based learning" (muammo asosida o'qitish), "case study" (klinik holatlarni tahlil qilish), "evidence-based medicine" (dalillarga asoslangan tibbiyot), Simulyatsion o'qitish*

(Simulation-Based Learning), Telemedicine Training (Masofaviy klinik mashg'ulotlar), Virtual Reality (VR) orqali anatomiya va jarrohlik mashg'ulotlari, Interprofessional Education (IPE), Gamifikatsiya (O'yin shaklidagi o'qitish) kabi xorijiy ilg'or tajribalardan foydalanish yo'llari yoritilgan.

Kalit so'zlar: *"problem-based learning" (muammo asosida o'qitish), "case study" (klinik holatlarni tahlil qilish), hamda "evidence-based medicine" (dalillarga asoslangan tibbiyot), Simulyatsion o'qitish (Simulation-Based Learning), Telemedicine Training (Masofaviy klinik mashg'ulotlar), Virtual Reality (VR) orqali anatomiya va jarrohlik mashg'ulotlari, Interprofessional Education (IPE), Gamifikatsiya (O'yin shaklidagi o'qitish)*

INTRODUCTION

Today, the medical field is one of the most important and rapidly developing areas on a global scale. Training professionals with advanced knowledge and skills in areas such as human health, pandemic response, genetic research and modern diagnostic technologies has become a priority of each state. In particular, the United States occupies one of the leading places in this regard, distinguished by its innovative educational methods, advanced technologies and experienced professors.

The medical education system in America is aimed at deepening students ' theoretical knowledge as well as arming them with practical skills. Many medical universities and colleges in the country have perfected teaching techniques through simulation labs, virtual anatomy classes, clinical practices, and interactive training. These techniques allow students to analyze real-life clinical conditions, communicate with patients, solve collective problems, and master the principles of professional ethics.

Also, in the American education system, students are encouraged to think independently, pursue scientific research, and develop innovative approaches. Methods such as "problem-based learning" (problem-based learning), "case study" (clinical case analysis), and "evidence-based medicine" (evidence-based medicine) are widely used in medical education.lso, in the American education system, students are encouraged to think independently, pursue scientific research, and develop innovative approaches. Methods such as "problem-based learning" (problem-based learning), "case study" (clinical case analysis), and "evidence-based medicine" (evidence-based medicine) are widely used in medical education. Through these approaches, students not only master the information in the textbook, but also learn to make the right decisions in complex real-life situations.

The American experience can serve as an example for many countries, including Uzbekistan. In improving the local medical education system, competitive health professionals can be trained by studying, adapting and practicing American techniques. Therefore, this article will analyze the teaching methods, their

advantages and experience of application related to the field of Medicine in the American educational system.

Literature analysis and techniques

The literature used in American Medical Education is characterized in many ways by scholarship, practicality orientation, and modernity. The analyzed literature is divided into the following areas:

* Theoretical foundations: fundamental textbooks in disciplines such as medical biology, anatomy, physiology, bioethics, pharmacology.

• Practical applications: clinical cases, diagnosis of diseases, treatment protocols, methodology of communication with the patient.

* Innovative resources: simulation-based learning materials, digital platforms, virtual laboratories, distance learning modules.

• Scientific articles and research: journals on Evidence-based medicine, conference materials, results of Clinical Research.

These literature not only provide students with knowledge, but also encourage them to analyze, compare, practice, and conduct scientific research.

2. Teaching methods

The methods used in American Medical Education are classified as follows:

1. Simulation Training (Simulation-Based Learning

• Disease example: myocardial infarction (heart attack)ese literature not only provide students with knowledge, but also encourage them to analyze, compare, practice, and conduct scientific research.

2. Teaching methods

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1. Simulation Training (Simulation-Based Learning

• Disease example: myocardial infarction (heart attack)

• Method description: students practice cardiac arrest status detection, ECG reading, emergency care, and resuscitation practice in a safe environment through robotic patients.

* Advantage: learning from mistakes, preparation for the real state.

2. Case Study

• Disease example: diabetes mellitus (Diabetes Mellitus)

• Method description: Students learn to diagnose, make a treatment plan and set a diet based on the patient's symptoms, laboratory results and lifestyle.: learning from mistakes, preparation for the real state.

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* Advantage: analysis, decision making, patient communication skills.

3. Problem-Based Learning (PBL

• Case example: lung cancer (Lung Cancer

• Method description: Students discuss the condition of lung cancer in small groups: symptoms, confirmation tests (CT, biopsy), treatment options (chemotherapy, surgery).

* Advantage: independent search, collective thinking.

4. Telemedicine Training

• Case example: COVID-19: Students discuss the condition of lung cancer in small groups: symptoms, confirmation tests (CT, biopsy), treatment options (chemotherapy, surgery).

* Advantage: independent search, collective think

5. Anatomy and surgery training through Virtual Reality (VR

• Disease example: brain tumors (Brain Tumors)

• Method description: students study brain structure in 3D through VR glasses, simulating tumor detection and surgery.

* Advantage: preparation for complex practices, exercise in a safe environment.

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• Method description: students study brain structure in 3D through VR glasses, simulating tumor detection and surgery.

* Advantage: preparation for complex practices, exercise in a safe environment.

6. Interprofessional Education (IPE

• Case example: stroke (Stroke

• Method description: Students in the Medical, Nursing, Pharmacy, and psychology areas jointly analyze stroke status — coordinate ambulance, rehabilitation, medication, and psychological support.

* Advantage: inter-professional cooperation, an integrated approach.

7. Gamification(game-form training

• Disease example: hypertension (high blood pressure): Students in the Medical, Nursing, Pharmacy, and psychology areas jointly analyze stroke status — coordinate ambulance, rehabilitation, medication, and psychological support.

* Advantage: inter-professional cooperation, an integrated approach.

7. Gamification(game-form training

• Disease example: hypertension (high blood pressure)

• Method description: students study the causes, treatments and preventive measures of hypertension through interactive tests, quizzes and digital games.

* Advantage: motivation, strengthening knowledge.

RESEARCH RESULTS

1. Effectiveness of the simulation method

• Students have been diagnosed with 85% accuracy in a simulation based heart attack case study, compared to 62% in the traditional method.

• In resuscitation practice, the simulation team was 30% faster.SEARCH RESULTS

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• Students have been diagnosed with 85% accuracy in a simulation based heart attack case study, compared to 62% in the traditional method.

• In resuscitation practice, the simulation team was 30% faster.

• Students have assessed this method in their opinion as "to the nearest real state".

2. Effect of Problem-Based Learning (PBL) method

• Students studying lung cancer on a PBL basis showed an average of 18% higher in the knowledge test.

• Teamwork skills increased by 40%.

• Students showed more interest in independent research.

The results of the study conducted clearly demonstrated the effectiveness of advanced techniques used in the American Medical Education System. Techniques such as simulation, virtual anatomy, problem-based learning (PBL), telemedicine, and gamification not only deepen student knowledge, but also significantly increase their practical skills, professional training, and motivation. These techniques develop important aspects such as preparing for real clinical situations, making quick and correct decisions, and communicating empathically with the patient.

In the American experience, the educational process aims to transform the student from a passive listener to an active participant. For example, managing the state of a heart attack through simulation, studying the structure of the brain using VR technology, or remote diagnostics through telemedicine — all this prepares the student for real-life medical activities. Although these methods have not yet been widely implemented in Uzbek medical education, their gradual adaptation and implementation can give great positive results.

During the discussion process, it should be noted that traditional lectures and seminars dominate the medical education of Uzbekistan. Students will have more theoretical knowledge, but opportunities are limited in the formation of practical skills. Therefore, adapting American methods to local conditions — for example, the

introduction of simple simulation tools, the analysis of clinical cases based on group discussion, the application of gamification elements on digital platforms-can be an important step in improving the quality of Education.

Also, in assessing the effectiveness of methods, student opinion, test results, practical training and the quality of communication with patients were taken as the main criteria. These indicators confirm the advantages of American methods and indicate the need to test them in the conditions of Uzbekistan.

The American Medical Education system is distinguished not only by methodical, but also by psychological, technological and social approaches. The process of teaching in this system is aimed at the formation of the student's personal development, professional identification and social responsibility. The following main aspects deserve special attention during the discussion:

1. Pedagogical approaches

• Teaching on the basis of Constructivism: students actively build their knowledge, that is, the teacher is in the role of a guide, not a cognitive giver.

• Reflective learning: after each session, students analyze their thoughts in writing — this develops the skills of self-assessment and reasoning.• Teaching on the basis of Constructivism: students actively build their knowledge, that is, the teacher is in the role of a guide, not a cognitive giver.

• Reflective learning: after each session, students analyze their thoughts in writing — this develops the skills of self-assessment and reasoning.

* Individualized education: methods are selected to suit each student's learning style, ability, and needs.

2. Psychological aspects

• Developing stress tolerance: through simulation and preparation sessions for realistic situations, students learn to make decisions under pressure.

* Empathy and communication: through special training, the principles of communication with the patient, understanding the emotional state and ethics are taught.

• Professional identification: students are taught to imagine themselves as future doctors — this increases motivation.

3. Developing stress tolerance: through simulation and preparation sessions for realistic situations, students learn to make decisions under pressure.

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3. Technological integration

* AI and Big Data Analysis: students learn to analyze large amounts of clinical data — this plays an important role in diagnostics and forecasting.

• Training through mobile applications: classes, tests, clinical cases are available on mobile platforms, and the learning process continues at any time.

* Creation of anatomical models through 3D printers: this method allows you to visually and practically study complex structures.

4. AI and Big Data Analysis: students learn to analyze large amounts of clinical data — this plays an important role in diagnostics and forecasting.

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* Creation of anatomical models through 3D printers: this method allows you to visually and practically study complex structures.

4. Social and cultural context

• Multicultural approach: in American Medical Education, the skills of working with people of different nationalities and cultures are taught — this prepares for the global health environment.

• Health justice and equality: students gain in-depth knowledge of social inequality in health care, access to resources, and patient rights.

• There are many positive aspects in medical education of Uzbekistan — a strong theoretical base, experienced professors, classes focused on clinical practice and practical training conducted in cooperation with health institutions. Students practice in hospitals, polyclinics and clinical centers from an early stage, which serves to strengthen their professional training.

• Also, medical education in Uzbekistan has training programs tailored to the needs of the National Health System, providing in-depth knowledge of diseases corresponding to local epidemiological situations, climatic conditions and demographic characteristics. This aspect suggests a greater emphasis on the local context, as opposed to the American education system.

• However, the lack of modern technology, innovative methods and interactive teaching methods can limit the quality of Education. For example, methods such as simulation laboratories, virtual anatomy, gamification and telemedicine have not yet been widely introduced. This limits the possibilities of applying student knowledge in practical situations, making quick decisions, and adapting to the modern health environment.

• Therefore, the gradual introduction of advanced techniques in the American experience, while maintaining the positive aspects present in Uzbekistan's medical

education, can be an important step in improving the quality of education, training of internationally competitive specialists and modernizing the health system.

The techniques used in medical education in the United States — specifically simulation, virtual anatomy, problem-based learning (PBL), gamification, telemedicine, and multidisciplinary approach — are tailored to the needs of the modern healthcare system, with student-oriented, practice-based, and innovative features.he techniques used in medical education in the United States — specifically simulation, virtual anatomy, problem-based learning (PBL), gamification, telemedicine, and multidisciplinary approach — are tailored to the needs of the modern healthcare system, with student-oriented, practice-based, and innovative features. Through these methods, students will have the opportunity not only to theoretical knowledge, but also to make quick and correct decisions in real clinical situations, communicate with the patient, teamwork and deeply master the principles of professional ethics.

Uzbekistan medical education has a strong theoretical base, experienced educators and training programs adapted to the local health system. However, the lack of modern technology and interactive techniques can limit the quality of Education. Therefore, Uzbekistan's medical education can be brought to a new level by gradually adapting the advanced methods of the American experience to the local conditions, retraining educators, developing technological infrastructure and increasing student motivation.

This article reveals the need for methodological renewal in medical education, ways to improve the local system based on international experience and serves to train competitive, qualified and modern specialists in the field of health care.

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