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THE ROLE OF PRACTICAL TRAINING AND CLINICAL PRACTICE IN TRAINING SPECIALISTS IN MEDICAL COLLEGES

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Annotatsiya:
Ushbu maqolada tibbiyot texnikumlarida o‘rta bo‘g‘in tibbiyot kadrlarini tayyorlashda amaliy mashg‘ulotlar va klinik amaliyotning ahamiyati tahlil etilgan. Tibbiy ta’limda nazariya va amaliyotning uzviyligi, simulyatsion texnologiyalar, klinik baza bilan hamkorlik, innovatsion uslublar va davlat siyosatining texnikumlar faoliyatiga ta’siri ilmiy asosda yoritilgan. Tahlillar tibbiy texnikumlar bitiruvchilarining kasbiy tayyorgarligini oshirishda amaliyotning hal qiluvchi rol o‘ynashini ko‘rsatadi.

Kalit so‘zlar: Tibbiyot texnikumi, amaliy mashg‘ulot, klinik amaliyot, simulyatsion texnologiya, kasbiy kompetensiya, ta’lim islohoti, texnikum bitiruvchisi, hamkorlik.

Аннотация:
В статье рассматривается значение практических занятий и клинической практики в процессе подготовки медицинских кадров среднего звена в медицинских техникумах. Особое внимание уделено интеграции теории и практики в медицинском образовании, внедрению симуляционных технологий, взаимодействию с клиническими базами, инновационным подходам и влиянию государственной политики на деятельность техникумов. Анализ показывает ключевую роль практики в формировании профессиональных навыков у студентов.

Ключевые слова: Медицинский техникум, практическое занятие, клиническая практика, симуляционные технологии, профессиональная компетентность, образовательная реформа, выпускник техникума, сотрудничество.

Abstract:
This article analyzes the role of practical sessions and clinical practice in training mid-level medical professionals in medical colleges (technicums). It emphasizes the integration of theory and practice in medical education, the use of simulation technologies, collaboration with clinical institutions, innovative teaching methods, and the influence of government policies on technicum activities. The analysis highlights the vital importance of hands-on training in developing students’ professional competencies.

Keywords: Medical technicum, practical training, clinical practice, simulation technology, professional competence, educational reform, technicum graduate, partnership.

Today, the field of medicine plays a crucial role in ensuring public health, and the training of qualified medical personnel has become a pressing issue. The medical education system, particularly technical colleges that prepare mid-level specialists, plays a significant role in supplying the healthcare system with personnel equipped with practical skills. Medical knowledge and skills should not be limited to theoretical lessons only — as it is often said,

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"especially in the field of medicine, a student who learns only theory can never become a skilled doctor. Medical education has always been carried out alongside practice." Therefore, the principle of the integration of theory and practice is considered fundamental in modern medical education.

In recent years, a number of reforms have been implemented in Uzbekistan to improve the system of training medical professionals. In particular, in line with the 2019–2025 Health System Development Strategy, new approaches have been introduced into medical education. This article presents a scientific and analytical examination of the role of practical training and clinical practice in the development of professional skills among students in medical colleges.

Medical colleges are educational institutions specialized in training mid-level medical professionals (such as nurses, feldshers, and lab technicians). These institutions have been established as a new form of medical colleges. Since 2020, based on a presidential decree, 47 medical colleges in Uzbekistan have been reorganized into Public Health Technical Colleges named after Abu Ali ibn Sina. The main goal of this reform is to train specialists with deep theoretical knowledge and practical skills in accordance with modern educational standards for the healthcare sector — particularly to strengthen the primary healthcare system with qualified professionals.

Another objective set for these colleges is to ensure the continuity of medical education. Graduates of technical colleges are granted the right to continue their education from the second year of undergraduate programs at higher medical institutions in their respective specialties, without entrance exams (through an interview-based admission). On one hand, this ensures the integration of the knowledge and skills acquired in technical colleges with higher education; on the other, it provides talented graduates with opportunities for academic and professional growth.

In addition, state-level goals for these colleges include strengthening their material and technical base, ensuring the availability of qualified teaching staff, and introducing innovative approaches into the educational process. A special comprehensive government program has been adopted to effectively organize the activities of medical colleges. According to this program, practical training facilities are to be equipped in line with established standards, simulation classrooms (with mannequins and training devices) are to be created, and new subjects and specializations are to be taught in greater depth. The main aim of these measures is to ensure that graduates of medical colleges are highly competitive in the labor market and have strong practical preparation.

Special attention is paid to the development of professional skills among students in medical colleges alongside theoretical knowledge. Practical training includes laboratory and training room sessions where students reinforce the topics learned in theory through hands-on experience. For example, in anatomy classes, students work with mannequins and models; in nursing classes, they practice intravenous injections using specially designed arm and leg models; and in laboratory diagnostics courses, they perform various analytical procedures. These training sessions are designed to closely resemble real-life professional tasks that students will face in their future careers.

In practical lessons, various pedagogical methods are applied. Traditionally, instructors first demonstrate a skill using the *demonstration method*, after which students are encouraged to independently and willingly repeat the task. To increase student engagement and improve lesson effectiveness, interactive methods such as role-playing, case-based learning (CBL), and

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problem-solving in small groups are employed. In recent years, the integration of simulation technologies into medical education has become a priority — in special simulation centers, students are given the opportunity to develop practical skills without causing harm to real patients. According to government regulations, all practical classrooms in technical colleges are to be equipped with modern simulators and necessary medical equipment. This initiative contributes to the overall quality of practical training.

For example, the Fergana Medical Technical College has established a special "Innovative Practice Center" for pre-clinical training. This center is equipped with modern medical devices, full-body mannequins, and hands-on training simulators. Each theory and practice classroom is equipped with computers, projectors, and interactive whiteboards, enabling instruction through visual and digital materials. Such an environment allows students to link theoretical knowledge with practical skills and promotes a deeper understanding of subjects through visual observation and hands-on activities. Scientific studies show that while only around 17% of information obtained through listening is retained, 50–70% of visual information remains in memory, and repeated practice can increase retention rates to 90–100%. Therefore, conducting practical training sessions using visual and interactive tools and actively involving each student in the process is an essential methodological principle in medical technical colleges.

It is now impossible to train highly competent modern medical specialists without using innovative technologies that meet the requirements of practical training and contemporary standards. For this reason, alongside traditional methods, educational institutions are increasingly incorporating simulation training, virtual laboratory sessions, and multimedia applications.

Clinical practice (also known as industrial practice) is a separate stage in the professional training of technical college students. While classroom and laboratory lessons are considered "pre-clinical," clinical practice takes place directly in medical institutions — hospitals, polyclinics, clinics, or laboratories — and serves as a qualification-based practicum. During clinical practice, students work with real patients and test their theoretical knowledge and skills in a real professional setting. The importance of this stage lies in the student's ability to apply abstract theoretical knowledge in real-life situations, make decisions in specific scenarios, and work as part of a healthcare team. Moreover, students develop communication skills and internalize professional ethics and deontological principles in real clinical environments.

To organize clinical practice successfully, certain conditions must be met. First and foremost, technical colleges must establish partnerships with healthcare institutions and determine the base for student practice. Typically, each college signs a cooperation agreement with a regional polyclinic, emergency hospital, family health clinic, or specialized medical center. Qualified physicians and experienced nurses are assigned as practice supervisors (mentors) to guide and mentor the students. For example, the private "Avicenna" Medical Technical College in Tashkent has implemented a system whereby its students begin their clinical placements at prominent city hospitals and clinics starting from their first academic year. These placements are organized under the supervision of professional physicians. This approach allows students to experience the real world of medicine from the very beginning and to understand the social responsibility of their profession.

The curricula developed by the Ministry of Health of Uzbekistan for medical education institutions clearly specify the timing, duration, locations, and procedures for both academic

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(pre-clinical) and industrial (clinical) practice. According to the curriculum of technical colleges, short-term observational practice is generally conducted during the early years, while full-scale industrial practice takes place during the senior (graduation) phase. For instance, a nursing student in the final year may complete clinical practice by working for several weeks as a nurse assistant in a polyclinic or hospital, while a feldsher student may gain hands-on experience at an emergency medical station. As per established procedures, students maintain a daily logbook of their activities during practice, mentors assess their performance, and a final evaluation (attestation) is conducted to verify the skills the student has acquired.

The effectiveness of clinical practice largely depends on how well it is organized. Previously — before the reforms — final-year students in medical education typically completed their industrial (clinical) internship only during the summer break. This made it difficult for educational institutions to monitor students' participation, and in many cases, students would skip their internships altogether. As a result, graduates would often enter the workforce without adequate practical skills, requiring on-the-job training from the ground up.

Since 2019, however, a new system has been introduced in which industrial internships are divided into two stages: winter and summer semesters. That is, a final-year student completes part of their internship at primary-level polyclinics during the winter and continues this internship during the summer. This approach allows institutions to monitor students' progress throughout the semester and supports the consistent development of practical skills. Active participation in internships also increases students' chances of future employment — internship supervisors often offer jobs to talented graduates who have demonstrated strong performance.

As part of Uzbekistan's broader reforms in medical education, technical colleges have been established as key institutions and their activities are now governed by official regulatory documents. As mentioned earlier, the Presidential Decree of May 6, 2019, outlined priority directions for the development of medical and pharmaceutical education. It emphasized the need to bring medical education closer to real healthcare practice and to introduce modern teaching formats and methods. The Presidential Decree No. PQ-4666, dated April 7, 2020, directly introduced a new system for training mid-level medical personnel. This decree established the system of technical colleges and initiated updates to their material base and curricula, aligning them with international best practices.

Subsequently, Resolution No. 466 of the Cabinet of Ministers, dated August 7, 2020, approved the reorganization of specific regional medical colleges into technical colleges. As a result, approximately 47 medical technical colleges were established across various regions and districts of the country.

An analysis of the technical colleges' experience reveals several noteworthy aspects. First, the content of training in these colleges is based on national education standards and qualification requirements. For each specialty (e.g., nursing, physiotherapy, pharmacy, etc.), model curricula were developed. These curricula increased the number of hours allocated to professional subjects and practical training alongside general education courses. Second, the share of practical lessons in the curriculum has grown significantly — in some professional courses, more than half of class hours are dedicated to practical training. Third, integration between technical colleges and higher medical institutions has been established. For example, in line with the decree, highly qualified professors from medical universities now deliver lectures to technical college students via distance learning. This gives students the opportunity

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to learn from experienced university educators, thereby improving the overall quality of education.

Furthermore, the Ministry of Health has developed specific procedures and methodological guidelines to strengthen the clinical bases of technical colleges. For instance, standard templates for partnership agreements between colleges and medical institutions have been approved. These documents define which departments students will practice in, the duration of practice, student responsibilities, and the duties of clinical mentors. Such formal agreements ensure that students are fully engaged during internships and that each day of practice is structured according to the educational plan.

In addition, the process of graduate employment is being monitored. Reports from local government authorities and ministries often include data on employment rates. Overall, the recent experience of medical technical colleges shows that students are graduating with a solid foundation in theoretical knowledge and well-developed practical skills. It is expected that this educational tier will make a significant contribution to supplying the healthcare sector with qualified personnel in the near future.

The introduction of modern technologies into the educational process of medical technical colleges is one of the most important factors in enhancing the quality and effectiveness of personnel training. Today, almost all technical colleges are equipped with computer-based classrooms, and many lessons are conducted using electronic slides, educational videos, and interactive applications. For instance, in some institutions, interactive smart boards are used to display the structure of the human body in 3D format, and students follow and analyze the latest developments in the field of medicine via the Internet as part of their lessons — a method that aligns with modern educational demands.

As previously mentioned, simulation training centers are equipped with mannequins and simulators that allow students to refine their practical skills in an artificial environment. For example, using mannequins designed for intensive care training, students can practice cardiopulmonary resuscitation multiple times without risking harm to real patients. Students specializing in laboratory technology can conduct chemical experiments in a safe environment using virtual lab programs.

The introduction of new technologies not only enlivens the learning process but also prepares students for the innovative real-world environments they will encounter in their professional careers. Some technical colleges are using “virtual patient” programs, where a patient's clinical condition is displayed interactively on a computer screen. Students can practice collecting patient histories, making diagnoses, and developing treatment plans. There are also initiatives to integrate elements of telemedicine into the curriculum, enabling students to acquire skills such as remote consultation and the analysis of diagnostic results from a distance. Such innovative approaches enable graduates to adapt quickly to modern healthcare systems and work effectively in line with global trends.

Partnerships between technical colleges and healthcare institutions are also expanding. Various levels of medical institutions across the country are opening their doors to students for clinical practice. Regional emergency care centers, multidisciplinary hospitals, family clinics, and specialized medical centers are signing contracts with technical colleges and serving as base institutions for internships. These collaborations benefit both sides: students gain real-life experience in medical facilities, while hospitals have the opportunity to identify and prepare potential future employees. For example, the First Medical Technical College in Tashkent

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(Registon College) sends its students to the city branch of the Republican Scientific Center for Emergency Medical Aid. Under the slogan “Theory without practice is useless,” students test their knowledge in real surgical departments and ambulance teams.

These examples confirm that partnerships between colleges and healthcare facilities are becoming stronger year by year, and the integration of education with practice is being systematized. The system of medical technical colleges in Uzbekistan has already proven its relevance in a short period and is now a crucial link in the training of healthcare personnel. Practical and clinical training allows students to consolidate theoretical knowledge through real professional experience. The analysis shows that compared to traditional college graduates, technical college graduates are better prepared for the workplace, having had the opportunity to acquire many practical skills during their studies.

However, some challenges remain. In certain remote areas, there is a shortage of modern simulation equipment, and local resources are insufficient for conducting full-scale clinical practice. As a solution, it is recommended to allocate additional funding to colleges and introduce a “cluster” system that connects them with major medical centers. Additionally, it is essential to motivate and train internship mentors — experienced nurses and doctors should undergo pedagogical training courses and receive instruction on how to guide technical college students effectively.

Looking ahead, it is necessary to continue expanding innovative approaches to improve the quality of practical education in medical technical colleges. These include teaching surgical procedures using virtual reality technologies, developing remote simulation training platforms, and establishing student and faculty exchange programs with leading foreign technical colleges. Furthermore, continuous monitoring of graduates’ career performance and collecting employer feedback can help refine and improve curricula. The integration of professional training, science, and practice is the key to producing high-quality medical professionals. The technical college system introduced in Uzbekistan represents a significant step toward ensuring this integration. Strengthening and developing this system will further enhance the capacity of the healthcare sector by preparing competent professionals with strong practical experience.

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