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APPLICATION OF MODERN PEDAGOGICAL TECHNOLOGIES IN THE PROFESSIONAL EDUCATION OF FUTURE DENTISTS

Abstract.
For the further effective development of higher dental education, it is necessary to introduce modern innovative methods of learning and teaching. Today, in the healthcare sector, more and more attention is paid to patient safety, ethical issues, increased responsibility of healthcare professionals, high level of professional qualifications and rapid evolution of procedures and methods. The mentioned above requires the adaptation of curricula and the use of all available educational tools and technologies in the professional training of future dentists. The use of simulation learning technologies and the case method in the education of future dentists contributes to the formation of skills and practical knowledge, professional competence, personal development, the ability to have optimal behaviour and be effective in various clinical situations.

Keywords: *modern pedagogical technologies, simulation learning, case method, student, dentistry.*

Introduction. Higher medical education institutions are faced with many challenges, among which the most important is to change the style of teaching and the need to reduce the gap between theoretical knowledge and clinical practice. Training an educated, creative personality, ready to meet the needs of society both at the national and international levels in their professional activities, is the most important task of education reform in Ukraine. The introduction of a competence-based approach and the formation of professional competence of future specialists is the highest indicator of the quality of education [1]. More and more attention is paid to patient safety, ethical issues, increased responsibility of healthcare professionals, high level of required professional qualifications and rapid evolution of procedures and methods [2]. The mentioned above requires the adaptation of curricula and the use of all available educational tools. Scientists consider the development and use of modern pedagogical technologies as one of the main conditions for the formation of a future medical specialist, and their implementation is one of the most important tasks of modern education - managing the learning process [3]. Strict requirements of the present require higher education institutions to achieve a qualitatively new level of presentation of educational material, so, in addition to traditional ones, modern pedagogical technologies are widely used.

Purpose of the study: to analyse theoretically the scientific psychological, pedagogical, methodological and medical publications, educational and methodological work of the department on the use of pedagogical technologies in the process of professional education of future dentists.

Material and methods of research. Analysis of psychological, pedagogical, methodological literature, materials of scientific and practical conferences, educational and methodological work of the department. To achieve the goal, to clarify the essence and features of the use of modern pedagogical technologies in the educational process, theoretical methods were used: analysis, synthesis, generalisation, comparison, systematisation, pedagogical modelling, theoretical prognosis, etc.

Results and discussion. Reforms in higher education institutions and job market requirements for graduates are prompting a shift from the established authoritarian pedagogy to the level of knowledge accumulation to the ability to effectively use it, from collective to individual learning. This leads to the renewal of professional training and is closely related to the fundamental changes in education in the context of the competence approach that are taking place in most countries [4]. Each competence contains a list of relevant knowledge and skills, which are formed in the process of studying individual subjects, i.e. the formation of a specific competence occurs through the integration of knowledge and skills from different subjects, which indicates the possibility of applying an interdisciplinary

approach to the formation of educational content. Today, teachers increasingly feel the need to introduce pedagogical technologies that would help implement a personal approach to students, as this is an important component of the development of professional competence of future specialists. Tendencies in the development of modern professional training actualise further research on the introduction of the latest pedagogical technologies in sectoral education, including medical education. In the educational process of professional training of future dentists, teachers are tasked not only with developing in-depth knowledge of the disciplines, but also with teaching students to integrate theoretical knowledge into the problems of practical medicine.

In the process of studying, future dentists must master general professional and integral competences, master fundamental and professionally oriented knowledge, skills and practical skills necessary to perform typical professional tasks related to activities in the medical field. The analysis of the professional training of future doctors in the educational programme «Dentistry», the analysis of the curricula of academic disciplines, as well as our own pedagogical experience allow us to assert that the leading task facing future specialists in the process of professional training is the formation and development of clinical thinking, which will allow them to take an active cognitive position, generate ideas, and choose the right decisions [5]. Clinical thinking is formed as the ability to highlight the main points, generalise, identify differences, synthesise information received by the student independently, which will undoubtedly help in future professional practice. The process of studying a discipline cannot consist only in the accumulation of theoretical and practical knowledge, it must have an important motivational component, because motivation is the key to conscious mastery of the profession. To achieve these objectives and form the professional competences of future dentists, it is appropriate to use pedagogical technologies that promote the development of students' clinical thinking and contribute to the solid acquisition of knowledge. Among such technologies, in our opinion, we should highlight simulation learning technologies and case technologies. The use of simulation technologies is one of the main areas of practical training of medical specialists in Europe and around the world. Practicing skills on simulators and in virtual operating rooms has proven effectiveness. In the medical education system, simulation technologies underpin a number of techniques that help reproduce clinical situations for the purposes of training, repetition, assessment and research. Simulation training is a mandatory component of professional training that uses a model to enable each student to perform a professional activity or its element in accordance with professional standards and/or rules of medical care [6]. A simulation can be represented by a person, a device, or a set of conditions that help to recreate an actual problem. The student must react to the situation in the same way as they would in real life. Therefore, simulation is a technique that allows you to replace or enrich the practical experience of the learner with an artificially created situation that reflects and reproduces problems that occur in the real world in a fully interactive manner. Simulation training is an educational methodology that involves an interactive activity of immersion in a professional environment by recreating a real clinical picture in whole or in part without any associated risk to the patient [7]. Simulators range from simple physical models of anatomical structures (e.g., models of skull bones, simulators for practicing specific skills) to complex devices and mannequins with high mechanical reality and computer control. The purpose of training using simulation scenarios is to acquire and master skills (technical, cognitive, behavioural) that make up the competence of a future specialist. Increasingly, simulation technologies are helping to develop practical skills in various medical specialities, including emergency medicine. The simulation training method is particularly important for developing skills in rare or critical conditions. Various types of simulators are widely used in medical education, including: *computerised mannequins, on-screen simulators* that allow you to simulate the appropriate response; *anatomical models* – used to teach and practice certain practical skills; *phantom* is a model of a human body or its part that replaces the original and helps to develop skills; *mannequin* – a figure on which you can practice interrelated skills; *simulator* – a device for artificially creating (imitating) various situations or objects, which allows you to develop certain skills and abilities; s*tandardised patients; a system of situational tasks; clinical-type training games* that develop clinical thinking; *organisational-activity type training games* that promote the development of professional and organisational skills [8]. The main difference between a simulator and visual manuals, which only facilitate the development of skills through knowledge, is that the use of a simulator allows you to develop skills necessary in real working conditions. Training with the help of computer simulation programmes involves the development of clinical thinking in any medical speciality. Computer programs that simulate various pathological conditions and their progression help to correlate certain disorders with a particular pathology. Realistic computer simulation helps to acquire certain skills at a lower risk and cost. In addition, simulation provides an objective assessment of learning outcomes and certification. Modern virtual reality tools are seen as a source of technological opportunities in education and medicine, complementing a set of traditional approaches to learning. The rapid reduction in the cost of computing power and computer hardware, as well as the sharp growth of the mobile device and application market, have contributed to the massive spread of virtual reality technologies and have drastically reduced the cost of teaching aids. The use of virtual reality in the practice of professional training of future dentists radically transforms the principle of visual content of education, and is fully consistent with the global trend in teaching disciplines, which consists in supplementing traditional approaches with modern methods of information transfer: expanding the availability of electronic libraries, anatomical and surgical databases, the emergence of advanced simulators that model the structures of the human body on a systemic and topographic basis with the

ability to build planar projections and three-dimensional three-dimensional models. The virtual identity of real objects, their versatility and multifunctionality can give the future doctor more life experience in perception and practical actions. High efficiency of implementation, the use of virtual reality tools as a full-fledged educational equipment that competes with traditional approaches, requires the availability of training programmes that have a script, a rigid algorithm of actions, which allows them to act as an educational technology. In their absence, only a teacher can transmit knowledge to a student. As a way of transferring and assimilating knowledge, existing virtual reality tools place high demands on the teaching staff, whose active competent position will allow the introduction of new technologies.

In order to develop clinical thinking in future dentists, case-study technologies are being introduced in the educational process in parallel with the improvement of traditional ones. The case method, or the method of situational exercises, is a teaching method that makes it possible to bring the learning process closer to the real practical activities of specialists. This method promotes the development of ingenuity, problem-solving skills, and the ability to analyse and diagnose problems. This pedagogical tool helps to understand a topic more deeply, develop imagination, practically test theory, explore ideas, identify patterns, relationships, formulate hypotheses, increase motivation, encourage thinking and discussion, obtain additional information, deepen knowledge, verify views, apply analytical thinking, problem-solving skills and rational conclusions, develop communication skills, combine theoretical knowledge with practical problem-solving, transform abstract knowledge into skills. In the area of medical pedagogy, this methodology allows developing clinical thinking based on the principles of evidence-based medicine and improving practical skills [9]. This methodology has been successfully applied worldwide in teaching medical sciences. This pedagogical technology can be implemented in different ways: it can be a small group format, a business role-playing method, a discussion method, standardised patients, etc. However, one of the important ways to implement the case-based learning methodology is the use of information and educational web technologies, which makes the learning process interactive, effective and allows scaling the learning materials to a large audience at the same time. The use of information and educational web technologies opens up opportunities for a wider range of clinical cases, including quite rare ones, and for high-quality visualisation of additional research methods, which is impossible in the traditional teaching format. Access to interactive clinical cases is open and can be realised via the Internet. An important advantage of the case-based learning method is that this experience can be repeated if necessary and mastered according to an individual learning trajectory at a convenient pace using Internet access. Interactive case studies are widely available on the websites of some medical educational institutions and in the online versions of medical journals and world societies of doctors of various specialties. Cases are illustrated materials that are shown to the user in a certain sequence. The user receives information about the patient using videos, graphic images, diagrams, etc., and after a while is able to choose a particular action, make a diagnosis, conduct differential diagnosis, prescribe examinations, and treatment. In Ukraine, the study of medical disciplines using the case method has only recently begun and requires the development and implementation of training for future professionals. Case technology is a complex and effective tool of innovative teaching technology that simultaneously not only reflects a practical problem, but also updates a certain set of knowledge that needs to be learned to solve it, and successfully combines educational, analytical and educational activities, which increases the efficiency of modern educational tasks. Thanks to case technologies, students are offered a real clinical situation, the description of which simultaneously reflects not only any practical problem, but also updates a certain set of knowledge that must be mastered to understand a specific task. There is still no specific standard for presenting cases in medical disciplines. Usually, cases are presented in print or on electronic media, multimedia presentations, and include photos, diagrams, and tables in the text, which makes them more visual for students. Case technology is an active problem-situational analysis based on learning by solving specific tasks – situations (cases) by a group of students. By working together, you need to analyse the symptoms, possible causes, find a practical solution, evaluate the proposed solutions and choose the most appropriate one. Cases for independent work are more extensive and contain more information. The use of case technology helps students to better memorise complex topics, develop and train clinical thinking, master the skills of differential diagnosis of various pathologies, clearly and concisely formulate their thoughts; develops listening skills, thereby stimulating interest in education.

Conclusions. 1. The use of simulation learning technologies and the case method in the training of future dentists contributes to the formation of skills and practical knowledge, professional competence, personality development, the ability to have optimal behaviour and be effective in various clinical situations.

2. Simulation training allows you to repeatedly and accurately reproduce important scenarios and action algorithms and provides an opportunity to adapt the learning situation for each student. The use of modern pedagogical technologies provides a controlling function, as it reveals students' knowledge and skills, an educational function, as it requires students to achieve a certain level of learning, and an educational function, as it forms the personal qualities of students. By effectively organising the student's independent and classroom activities, the teacher promotes the development of clinical thinking, which necessarily becomes the basis for the formation of qualified and successful doctors.

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