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Experience of application of innovative pedagogical technologies in higher medical education

The pedagogical activity of a higher education institution (HEI) is always guided by a certain content, that is, by the knowledge that a person must acquire in the course of learning, as well as by the quality of the learner. Depending on what the teacher is tasked with, his or her pedagogical activity may be either formative (traditional) or developmental (humanistic). Developmental education is innovative, which creates the conditions for the full development of all its participants and promotes the self-development of each of them.

The whole process of pedagogical activity of the teacher HEI is implemented through the use of certain pedagogical technologies, and during the rapid development of society – it is through the use of innovative pedagogical technologies, which are critical to human development. Analysis of foreign and domestic scientific-pedagogical

literature shows that innovative educational technologies are connected with the system approach to education and training and cover all aspects and elements of the educational system – from setting learning goals to design the entire teaching process, and then reviewing its effectiveness [1-4]. These technologies can be both material objects (various equipment, particularly, multimedia, computer), and educational systems, ways of organizing learning (games, workshops, round tables, conferences), methods and strategies. In addition, they should provide both personal and professional growth of teachers and academic performance of pupils/students in educational activities, in the end, optimizing life, financial, time and human resources.

The main purpose of applying any innovative pedagogical technology is to increase the efficiency of the educational process with the guarantee of achieving the planned learning outcomes.

In the era of active use of the intellectual potential of society, the pedagogical technologies of teaching and clinical disciplines to students, interns and postgraduate students in higher medical education institutions (HMEI) are regularly modernized. One of the main tasks of the pedagogical process in the medical university is to encourage all students to develop the skills and initiative necessary for a young professional to solve professional (and not only) tasks in the work of a doctor. In addition, they should develop general professional competences and skills to work independently in the field of professional skills, that is, skills should be formed independently to carry out both informational, educational and experimental research activities.

HMEI teachers are a key element of the pedagogical process in the implementation of various innovations in medical practice, and it is precisely them that directly implement the competency approach. In order to successfully solve the problems posed by modern medical education, it is necessary for the teacher of any discipline to have the proper level of professional competence and professionalism, to continuously increase his professional level, to be creative and proactive. For teachers of clinical disciplines, this is especially important and responsible, since it requires them not only to communicate with the student during the theoretical analysis of the topic of the class, but also to work together in real conditions of the health care facility - in a clinic or in a hospital near the patient's bed (sometimes - seriously ill); on the other hand, it is quite difficult because medical teachers have no pedagogical education. In addition, the continuous increase

in the requirements for the modern teacher of higher medical school, especially for his creative and prognostic abilities, actualizes both the problem of training of pedagogical staff and the training of highly qualified pedagogical staff.

In view of the above, consideration of the issues regarding the use of modern pedagogical and information technologies by teachers of clinical departments of the HMEI, discussing the effectiveness of their application and formulating the prospects for their development and improvement is extremely important and urgently needed.

The purpose of our work was the development and implementation of some innovative pedagogical technologies in the educational and educational process at the Department of Internal Medicine 1 of the State Institution "Dnipropetrovsk Medical Academy of the Ministry of Health of Ukraine" (SI "DMA").

Materials and methods of research. Lecturers of the Department of Internal Medicine 1 SI "DMA" have developed various innovative pedagogical technologies that are implemented and applied in the educational and educational process with students of the 4th year, interns, graduate students, clinical residents, doctors-trainees.

Research results. The following innovative pedagogical technologies have been developed and are constantly used in the educational and educational process by the staff of the Department of Internal Medicine of the State Institution "DMA".

1. Formation of students' motivation for learning by increasing the level of personal professional activity of teachers - the most important innovative pedagogical technology.

The motivation of young people to study is based not only on the choice of profession, understanding of its social and social significance, prestige, but also on a deep understanding of the need to learn practical skills, professional skills, improvement and expansion of theoretical knowledge, the possibility of scientific and creative activity. However, it happens that young people lack both a general outlook and outlook on the profession: there are no successful teachers at some heights in the profession, no information about their scientific activity, lack of knowledge about what are possible ways of professional realization, how to implement into the European space. At the Department of Internal Medicine 1 SI "DMA" there are all prerequisites for forming motivational views of both students and interns - all teachers are successful educators, scientists, researchers, doctors, creators of their present day.

It is a remarkable achievement of teachers that some of them, having successfully passed the tests of test preparation on the technology of Rochester School (USA) back in 1996, and today form such quality tests which, passing the most careful selection, are competitive and are included to databases for passing the licensing exam "Krok-2" for both domestic and foreign English-speaking students.

In 2017 the head of the department took part in the work of the international innovative educational-training program "School of Academic Writing: from Theory to Practice". The acquired knowledge about the technologies of writing scientific and methodological literature is widely used by her in personal practice as well as in daily work with graduate students in order to prepare them for future teaching activities.

Because teaching at a medical college is closely linked to the acquisition of new professional knowledge by teachers, it is extremely important that they continue to improve their personal professional level. To this end, employees utilize electronic communications and international contacts: under the British Medical Journal (BMJ), take real-time internships to master elective courses, take international distance courses (including antibiotic therapy), study on -pulmonology schools of the European Respiratory Society (ERS).

Since the main scientific direction of the department is the problem of pulmonology, employees conduct research to determine the features of the course, diagnosis, treatment and prevention in chronic obstructive pulmonary disease, bronchial asthma, pneumonia, develop methods of rehabilitation of patients with their impact on the quality of life. Much attention is paid to the introduction and improvement of innovative methods of research in pulmonology: computer spirographic study of the function of external respiration, methods of studying hyperactivity of the bronchi and fatigue of respiratory muscles, determination of the activity of markers of local and systemic inflammation status of patients, etc. National standards for the treatment of patients are being developed.

Other scientific fields, successfully developed by the staff of the department and implemented in the educational process, are devoted to the issues of cardiology, psycho physiological and psychotherapeutic aspects. The employees of the department have repeatedly trained abroad in the fields of pulmonology, cardiology, endocrinology, internal medicine, allergology.

Much attention is paid to the teaching process of the department. The department has established "Asthma-school" and "School for patients with

chronic obstructive pulmonary disease", "School for patients with high cardiovascular risk", "School for patients with diabetes". In 1997, within the framework of the All-Ukrainian program "Healthy lungs of Ukraine", a regional consulting and diagnostic office "Pulmis" was opened, later - a similar office "Spiro", in which students and interns are still studying, postgraduate research is being conducted, doctors are being trained - listeners.

2. Information and analytical support of the educational process.

The learning process for each cycle of students of the 4th year begins with a lecture block. That is why improving the technology of lecture material delivery is the key to the effectiveness of students' further learning. One of the pedagogical technologies is the "**problem lecture**", during which innovative methods of teaching are combined with the components of traditional learning. At the beginning of each such lecture, teachers formulate a problem, provoking students' desire to find the means to solve it, and the formulated problem forced them to follow more closely the course of the lecture and at the same time prepare for answering the questions of the lecturer.

The students, who were interviewed after the lectures on the new pedagogical technology, offered to them, noted that this form of education stimulates them to active cognitive and thinking activity.

3. Interactive technologies of educational and cognitive activity.

One of the types of innovative pedagogical technologies is an interactive technological project, which involves joint educational and cognitive activities of different groups of students. Interactivity involves subject-subject relations in the course of the educational process and, as a consequence, the formation of an information and resource environment [6].

The idea of conducting **interactive clinical conferences** for students of the 4th year was developed by the staff of the department. Both students studying internal medicine in Ukrainian and foreign students studying English are involved in preparing and participating in such conferences. Under the guidance of a curatorial teacher, students prepare clinical case analysis.

On the basis of the collected and analyzed materials pertaining to a particular patient, presentations are prepared with the use of graphic, tabular data, with wide use of video materials. The presentation series of reports of Ukrainian-speaking students is complemented by a translation into English and a simultaneous interpretation of the student-

speaker from Ukrainian into English. Foreign English students' reports are not accompanied by simultaneous translation or commentary in the Ukrainian language.

After analyzing a clinical case, students usually initiate a lively discussion about the main issues of clinical symptomatology, differential diagnosis, and approaches to the treatment of patients. Of course, discussion facilitators are teachers who help students overcome the language barrier and guide the discussion in the right direction. Thus, powerful factors of interactive learning technologies are involved, on the one hand, and on the other - serious motivational mechanisms for both in-depth theoretical study of factual material, acquisition of practical skills, and in-depth learning of a foreign language, which further enhances a communication and recognition background.

Innovative pedagogical technologies include **interactive forms of seminars**. In the curriculum of students of the 4th year of medical university one of the leading directions is the acquisition of practical skills in direct work with patients. This stimulates future physicians to take active actions, to realize their desires for a deeper assimilation of theoretical knowledge, allows in the future to communicate freely with patients independently. Experienced teachers (professors, associate professors) often use innovative "**master class**" technology that allows students to consolidate theoretical knowledge by joining the patient's examination with a subsequent full discussion of the clinical situation.

However, at the time of studying the topic, it is not always possible to demonstrate a patient with an appropriate diagnosis. In such cases, alternative methods of practical elaboration of the theme by innovative interactive technologies become alternative: "business game", "consilium", "ward team".

Seminar on "**business game**" technology is one of the methods of active learning and involves modeling of the clinical situation. During a business game, not only game or professional tasks are solved - training and, at the same time, professional education of students take place.

The work is done in a teaching audience. Each student plays a role in the game, which is chosen by lot. This "randomized" approach allows for a more objective assessment of the degree of theoretical background of each student. Preliminary diagnosis, which corresponds to nosology, is offered. The group defines such roles as "patient", "doctor of therapeutic department", "doctor of functional diagnostics department", "laboratory assistant", "pharmacist". If necessary, the roles of "nurse",

"physiotherapist", "relative", "department head" are added. Students who are not in the main group of study can correct each of the participants in the "medical-diagnostic process" as "experts" or "consultants".

Technology "**consilium**" at the beginning of the seminars, students receive thematic for the supervision of the patient and his medical history with the results of additional research methods. All students have the same job, but work individually. If necessary, they receive additional information from the teacher. After work each student in the presence of colleagues formulates a preliminary diagnosis, confirming it with data of additional methods of research, defends his opinion, enter into debate, learn to debate correctly. The issues of treatment or prevention are discussed by all students together under the guidance of a teacher. The proposed method allows to identify the level of knowledge and skills each student is motivated to study additional literature on the topic.

The use of different teaching methods for English-speaking students is quite effective, but the language barrier and cultural and ethnic differences cause some difficulties in dealing with patients. To overcome them, the experience of "**ward teams**" was introduced at the department, which in addition to the student includes a medical intern and / or a clinical resident. General coordination work is, of course, performed by the teacher. The basic principles of such pedagogical technology are mutual assistance and support, continuous exchange of information, joint analysis of it.

Therefore, the use of interactive training systems in medical students effectively influences the process of mastering their complex of clinical knowledge, is characterized by the individualization of educational approaches, is a powerful factor in the optimization of the educational process, which provides greater controllability, effectiveness and efficiency of learning.

4. Monitoring of intellectual development and professional growth is a new direction of evaluation activity.

An important and important role in the process of education of medical students is played by universal and objective control of the acquired knowledge, evaluation of the skills of using this knowledge in practice, solving problems based on the most common clinical situations. To this end, the "Krok" licensing exams were introduced in Ukraine. In turn, the emergence of this type of control required the development of training programs for the most effective preparation of students.

A web portal was developed on the basis of our department for conducting testing of domestic and foreign students of 4th year, as well as interns in order to prepare for passing the licensed examinations "Krok-2" and "Krok-3". The development was based on the "Yii" framework using the most common programming languages for web development (PHP7, HTML5, CSS3) and database creation (SQL: 2008). One of the general advantages of this computer program is the speed of testing and the objectification of the result.

Using the web portal offers great opportunities for distance learning of students. It is possible to create modes for intermediate and final controls, as well as for independent training.

Designed by the staff of the department and implemented in the educational process, such an innovative testing system frees up the teacher's time, objectifies the student's result and protects the examiner from errors during the test.

5. Didactic technologies as a necessary condition for improving the educational process.

The didactic materials, prepared by the staff of the department for independent work of students, are the basis for their further professional improvement. The manual "Course of lectures on internal medicine" (2018) can be attributed to innovative didactic technologies. Using it during the lecture, the student has the opportunity to deliberately dive into the learning process, making in the specially reserved areas of the sheet only the main notes about the lecture material, which is especially emphasized by the lecturer, and not mindlessly rewrite the text of the lecture, trying to catch up with anything.

6. Professional schools.

One of the most significant problems of training specialists with higher education is the competence of the teachers who provide the learning process. Research of the last decades of the twentieth century in the field of higher education pedagogy showed that a large number of persons (about 74%) without professional and pedagogical experience are involved in the educational process from different directions, carrying out their teaching activities at a situationally creative level. Therefore, older teachers are already being asked urgent questions: who are they, future associate professors and professors of medical science? what can they be offered today for the sake of better scientific, pedagogical and professional implementation in the future? what advice, guidance, guidance can you give them? how to support them by specifying the correct vector for further improvement?

In view of all of the above, three vocational schools have been set up at the Department of Internal Medicine 1 in 2017 [7].

"Young Scientist School" is an innovative educational "brand" of the department in training scientific and pedagogical staff. For the purpose of qualitative preparation of future teachers-scientists, the professors of the department conducts both individual and group classes with graduate students on technologies of international innovative educational-training programs, in particular concerning writing technologies and principles of design of scientific and research literature (articles, abstracts, patents) , industry innovations, etc.). Professors and associate professors teach the basics of teaching skills of assistants, graduate students, clinical residencies. Much attention is paid to the development of youth socialization, which is learned through participation in creative scientific competitions.

Within the framework of the started **"School of young teacher"** modernization of the content of vocational training of graduate students and young teachers who have just graduated from graduate school, to work in the conditions of the New Ukrainian Higher Medical School. Young people attend lectures, practical and seminars held by experienced teachers, take part in methodical meetings, group trainings on mastering practical skills at mock-ups, learn the principles of drawing test tasks "Krok".

"Clinician's School" is an innovative form of postgraduate education. Not only graduate students and other young specialists are involved in the work of this school, but also experienced teachers and doctors of health care establishments, which are the clinical bases of the department. At the meetings, the most complex clinical cases are discussed and analyzed in detail, diagnostic and medical errors are analyzed, and collegial decisions are made. The school is a necessary foundation for the professional growth of all clinical teachers.

7. Educational technologies - an innovative and priority component of the modern physician's personality formation.

The staff of the department constantly pays great attention to the education of the young generation, applying various innovative technologies: from work in the so-called "schools of patients" to participation in cultural and mass events [4].

"Patient Schools" and **"Health Days"** are a strong foundation for improving the effectiveness of the medical education process. Practical skills are being developed here, socialization of young people is being socialized here, their communication skills are increasing.

Of great importance is the own experience of teachers in the patriotic upbringing of young people. The permanent **exhibition "Under the domes of Ukraine"** with visiting sessions (in 2013 - to the Museum of the Academy, and in 2020 - to the library cell of the administrative building) is a kind of report of the teachers who have seen them for several years on trips in Ukraine. The systematization of the material allowed the authors to show the beauty of their native Ukraine to all those who admire the photo, to anyone who wants to know a little more about the history of their native land, who loves the beautiful. The 80 photos show the sophistication and variety of shrines - churches, cathedrals, churches. All these are silent photographic descriptions of architectural silhouettes that today make up the history of our land and have become part of the world's Christian culture.

In 2019, the heading **"My Country - Ukraine"** was launched at the pulpits of the academic "Pulse" newspaper. Since then, every issue of the newspaper has information about prominent people who have lived on the territory of our country at different times, created Ukrainian history and glorified our land and our people.

Conclusion. The peculiarity of higher medical education today is that teachers of educational institutions use different innovative pedagogical technologies. However, in one way or another, they address three main areas: a modern learning infrastructure that includes information, technology, organizational and communication components; the modern content of the discipline, which is transmitted to students not so much for the acquisition of subject knowledge, but for the development of adequate competences; and modern teaching methods - active methods of competency formation that are based on the interaction of learners and their involvement in the learning process, not just the passive perception of the material.

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Abstracts

KONOPKINA L.I., CZERKASOWA O.H. **Doświadczenie w stosowaniu innowacyjnych technologii pedagogicznych na wyższej uczelni medycznej.** Rozważanie zagadnień związanych z wykorzystaniem nowoczesnych technologii pedagogicznych i informatycznych przez nauczycieli katedr klinicznych wyższych uczelni medycznych, omawianie skuteczności ich zastosowania oraz formułowanie perspektyw ich rozwoju i doskonalenia jest niezwykle ważne i pilnie potrzebne. Podane jest doświadczenie w stosowaniu w procesie pedagogicznym na Wydziale Medycyny Wewnętrznej Akademii Medycznej w Dnieprze następujących technologii – kształtowanie u studentów motywacji do nauki poprzez zwiększenie poziomu osobistej aktywności zawodowej nauczycieli; wsparcie informacyjno-analityczne procesu edukacyjnego; interaktywne technologie aktywności edukacyjnej i poznawczej; monitorowanie rozwoju intelektualnego i wzrostu zawodowego; technologie dydaktyczne; szkoły zawodowe; technologie edukacyjne. Zastosowane technologie dotyczą trzech głównych obszarów: nowoczesnej infrastruktury edukacyjnej, która obejmuje komponenty informacyjne, technologiczne, organizacyjne i komunikacyjne; nowoczesnej treści dyscypliny, która jest przekazywana studentom nie tyle w celu zdobywania wiedzy przedmiotowej, co w celu rozwoju odpowiednich kompetencji; oraz nowoczesnych metod nauczania – aktywnych metod kształtowania kompetencji opartych na interakcji uczących się i ich zaangażowaniu w proces uczenia się, a nie tylko pasywne przyswajanie materiału. Poprawia to jakość nauczania dyscyplin klinicznych i jest obowiązkowym warunkiem opracowania i wdrożenia kompetencyjnego podejścia do nauczania.

Słowa kluczowe: interaktywne technologie nauczania; organizacja procesu edukacyjnego; technologie edukacyjne; osobowość lekarza.

КОНОПКИНА Л.І., ЧЕРКАСОВА О.Г. **Досвід застосування інноваційних педагогічних технологій у закладі вищої медичної освіти.** Розгляд питань щодо використання викладачами клінічних кафедр вищих медичних закладів сучасних педагогічних та інформаційних технологій, обговорення ефективності їх застосування та формулювання перспектив їх розвитку й удосконалення є надзвичайно актуальним і нагально необхідним. Надається досвід використання в педагогічному процесі на кафедрі внутрішньої медицини 1 Дніпропетровської медичної академії наступних технологій - фор-

мування у учнів мотивації до навчання завдяки підвищенню рівня особистої професійної діяльності викладачів; інформаційно-аналітичне забезпечення навчального процесу; інтерактивні технології навчально-пізнавальної діяльності; моніторинг інтелектуального розвитку та професійного зросту; дидактичні технології; професійні школи; виховні технології. Використовані технології стосуються трьох основних напрямів: сучасної інфраструктури навчання, яка включає інформаційну, технологічну, організаційну та комунікативну складові; сучасного змісту навчальної дисципліни, який передається учням не стільки для засвоєння предметних знань, скільки для розвитку адекватних компетенцій; та сучасних методів навчання – активних методів формування компетенцій, які ґрунтуються на взаємодії осіб, що навчаються, та на залученні їх до навчального процесу, а не лише до пасивного сприйняття матеріалу. Це дозволяє підвищити якість викладання клінічних дисциплін і є обов'язковою умовою формування і реалізації компетентісного підходу в навчанні. **Ключові слова:** інтерактивні технології навчання; організація навчального процесу; виховні технології; особистість лікаря.

КОНОПКИНА Л.И., ЧЕРКАСОВА О.Г. Опыт применения инновационных педагогических технологий в учреждении высшего медицинского образования. Вопросы использования преподавателями клинических кафедр высших медицинских учебных заведений современных педагогических и информационных технологий, обсуждение их эффективности и формулировка перспектив развития и совершенствования являются чрезвычайно актуальными и остро необходимыми. Предоставляется опыт использования в педагогическом процессе на кафедре внутренней медицины 1 Днепротетровской медицинской академии следующих технологий - формирование у учащихся мотивации к обучению благодаря повышенному уровню личной профессиональной деятельности преподавателей; информационно-аналитическое обеспечение учебного процесса; интерактивные технологии учебно-познавательной деятельности; мониторинг интеллектуального развития и профессионального роста; дидактические технологии; профессиональные школы; воспитательные технологии. Используемые технологии касаются трех основных направлений: современной инфраструктуры обучения, включающую информационную, технологическую, организационную и коммуникативную составляющие; современного содержания учебной дисциплины, которая позволяет студентам не только для усвоить знание

предмета, но и способствует развитию адекватных компетенций; современных методов обучения - активных методов формирования компетенций, основанных на взаимодействии обучающихся и на привлечении их к учебному процессу, а не только к пассивному восприятию материала. Это позволяет повысить качество преподавания клинических дисциплин и является обязательным условием формирования и реализации компетентностного подхода в обучении. **Ключевые слова:** интерактивные технологии обучения; организация учебного процесса; воспитательные технологии; личность врача.

KONOPKINA L.I., CHERKASOVA O.H. **Experience of application of innovative pedagogical technologies in higher medical education.** Consideration of issues regarding the use of modern pedagogical and information technologies, discussing the effectiveness of their application and formulation of prospects for their development and improvement is extremely important and urgently needed for teachers of clinical departments of higher medical institutions. The experience of using the following technologies in the pedagogical process at the Department of Internal Medicine 1 of Dnepropetrovsk Medical Academy is given - the formation of students' motivation for learning due to the increased level of the personal professional activity of teachers; information and analytical support of the educational process; interactive technologies of educational and cognitive activity; monitoring of intellectual development and professional growth; didactic technologies; specific schools for development; educational technologies. The technologies used to relate to three main areas: a modern learning infrastructure that includes information, technology, organizational and communication components; the modern content of the discipline, which is transmitted to students not so much for the acquisition of subject knowledge, but for the development of adequate competences; and modern teaching methods - active methods of competency formation that are based on the interaction of learners and their involvement in the learning process, not just the passive perception of the material. This improves the quality of teaching clinical disciplines and is a prerequisite for the formation and implementation of a competent approach in teaching. **Keywords:** interactive learning technologies; organization of the educational process; educational technologies; personality of the doctor.