

DOI [https://doi.org/10.32405/2218-7650-2022-20\(49\)-163-178](https://doi.org/10.32405/2218-7650-2022-20(49)-163-178)
UDC 378

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SELF-PERFECTION OF STUDENTS OF MEDICAL SPECIALTIES BY MEANS OF INFORMATION AND INTELLECTUAL TECHNOLOGIES

Abstract. This study substantiates the pedagogical conditions for the formation of self-improvement of medical students by means of information and intellectual technology. The modern educational paradigm is considered, which is aimed at finding innovative approaches to scientifically sound and consistent organizational and pedagogical support of its development. It is determined that one of the ways to implement the tasks is the consistent introduction of effective pedagogical conditions that will ensure the readiness of medical students to develop self-improvement through information technology. Different points of view of researchers regarding the interpretation of this phenomenon are analyzed. The main approaches to scientific and methodological training of teachers to use information technology in the educational process are identified, and the pedagogical conditions for creating an environment aimed at strengthening the motivation of medical students to use information and intellectual technologies in teaching and professional activities. Based on the analysis of a number of achievements and from our own practical experience we determine the pedagogical conditions for the development of self-improvement of medical students by means of information and intellectual technologies as a set of interdependent and interdependent information factors and methodological measures of the pedagogical process. future specialists have components of pedagogical competence and, as a result, improve the quality of self-improvement development for future professional activity. It is noted that information and intellectual technologies expand the educational space of higher education institutions and will attract leading specialists from other educational and research institutions to train students of medical specialties, interns and professional development of teaching staff.

Keywords. pedagogical conditions; self-improvement; motivation; information and intellectual technologies; professional training; educational process.

INTRODUCTION / ВСТУП / ВВЕДЕНИЕ

Formulation of the problem. The intensity of information flow, the pace of scientific and technological progress and the depth of public demand for a competitive specialist require higher education institutions (HEIs), medical in particular, to train a specialist who has a broad outlook, effectively integrates their potential, the requirements of a society capable of self-development and self-improvement, using innovative information technologies throughout life.

The modern educational paradigm is aimed at finding innovative approaches to scientifically sound and consistent organizational and pedagogical support of its development. One of the ways to implement the tasks is the consistent introduction of effective pedagogical conditions that will ensure the readiness of future doctors to develop self-improvement through information technology.

Analysis of recent research and publications. A number of domestic scientists, such as A. Aleksyuk, V. Andreev, A. Ayurzanain, L. Borisyuk, M. Borytko, Y. Bokhan, A. Vardanyan, B. Gershunsky, S. Goncharenko, I. Humenna, T. Gutsan. However, the analysis of literature research shows that the problem of self-improvement of future doctors by means of information and intellectual technologies has been given extremely insufficient attention and the solution of this problem requires a deeper and more thorough study.

AIM AND TASKS / МЕТА ТА ЗАВДАННЯ / ЦЕЛЬ И ЗАДАНИЯ

The *purpose* of this study is to substantiate the pedagogical conditions for the formation of self-improvement of medical students by means of information and intellectual technology.

In accordance with the stated purpose of the study, the following *tasks* were set:

- to determine the main approaches to scientific and methodological training of teachers to use information technology in the educational process;
- to study the pedagogical conditions in the formation of an environment aimed at increasing the motivation of medical students to use information and intellectual technologies in teaching and professional activities.

THE THEORETICAL BACKGROUNDS / ТЕОРЕТИЧНІ ОСНОВИ ДОСЛІДЖЕННЯ / ТЕОРЕТИЧЕСКИЕ ОСНОВЫ ИССЛЕДОВАНИЯ

Open access to information is a feature of the information society, and

medical students have access to a wide field of information anytime, anywhere. Medical universities, having a conservative organization of the educational process, currently do not provide or formally ensure the academic freedom and mobility of their students. Each clinical department is faced with the dilemma of how to ensure a high level of professional competence of medical students, which can be formed only «at the patient's bedside» and self-study of students in distance learning technologies of the information society. Analyzing the contradictions between the traditional system of organization of the educational process and innovative computer-based learning technologies, we must rely on the historical and philosophical laws of society. Every significant step in the development of a society has been associated with a change in the means of processing and transmitting information in that society. But always the bearer of professional knowledge and competencies has been and is a specialist, including in the information society. We remove this contradiction when we begin to see information technology as a more effective tool for achieving educational goals, which are already available to medical students.

RESEARCH METHODS / МЕТОДИ ДОСЛІДЖЕННЯ / МЕТОДЫ ИССЛЕДОВАНИЯ

To solve this goal and the tasks used the following research methods: the method of logical generalization – in the analysis of theoretical approaches to the organization of self-improvement of medical students; comparative analysis – in determining the features of self-improvement of students by means of information technology; problem-oriented – for scientific substantiation of strategic directions of solving issues of information and intellectual technologies.

RESULTS OF THE RESEARCH / РЕЗУЛЬТАТИ ДОСЛІДЖЕННЯ / РЕЗУЛЬТАТЫ ИССЛЕДОВАНИЯ

The development of readiness for self-improvement of medical students by means of information and intellectual technologies is a rather complex process, the effectiveness of which depends on the introduction and compliance with certain pedagogical conditions.

The concept of "pedagogical conditions" refers to various aspects of all components of the process of learning, education and development: goals, content, principles, methods, forms, tools and more. It can be used in relation to the whole educational process in characterizing the pedagogical system or its individual aspects or elements. As a rule, pedagogical conditions are understood as those that are specially created in the educational process in order to increase

its efficiency or the implementation of certain innovations.

Questions about pedagogical conditions have become the subject of attention of many researchers.

Important for our study of the development of self-improvement of medical students by means of information technology is the analysis of a number of scientific papers, which considered the pedagogical conditions of development and formation of various aspects of training of medical students. Thus, O. Fedorov defines pedagogical conditions as a set of objective possibilities of the content of education, methods, organizational forms and material possibilities of its implementation, which ensure the successful solution of the task [8].

Scientists A. Aleksyuk, A. Ayurzanain, P. Podkasisty argue that pedagogical conditions affect the process of achieving the goal, while dividing them into:

a) external: positive relations between teacher and student; objectivity of assessment of the educational process; place of study, premises, climate, etc.;

b) internal (individual): individual characteristics of students (health status, character traits, experience, skills, motivation, etc.) [1].

Instead, M. Demyanchuk, pedagogical conditions for the implementation of the competency approach in the preparation of future bachelors of nursing identified: creating a motivational and value environment in the educational process to develop students' values to master the profession of bachelor of nursing, directing future bachelors of nursing care to expand based on the study of disciplines «History of Medicine and Nursing» and «Nursing Ethics and Deontology», the organization of self-educational activities and the development of students' skills and skills of ethical and deontological behavior as a valuable asset of the future bachelor of nursing [4].

The application of a systematic approach in the comparison of professional training in medicine encourages the search for and effective improvement of the domestic system of training highly qualified specialists in medicine, which will contribute to economic development and its representation in the world labor market [5]. Substantiation of pedagogical conditions for the development of self-improvement of medical students by means of information technology will take into account the essence of the characteristics of such methodological approaches as: axiological, personality-oriented, subjective, activity. The axiological approach in the context of our study is the process of forming a personality focused on the highest professional achievements and professional self-improvement of the individual, professionalism is associated with a high level of readiness for systematic professional self-development.

Personality-oriented approach is a purposeful, planned, specially organized

pedagogical progress, which is based on taking into account the personal qualities and interests of students and promotes their further development.

The activity approach proves that the results of training future specialists for continuous professional self-development are noticeable only during the activity.

The subjective approach is a search for ways to form a creative personality, its focus on finding new, non-standard in all areas of human activity, the development of creative opportunities through special technologies.

The pedagogical conditions defined by us are closely interconnected and together aimed at achieving this goal, namely the formation of self-improvement of medical students by means of information technology. Consider in more detail each of the pedagogical conditions aimed at using information technology of medical students as a means of self-improvement (Fig. 1).

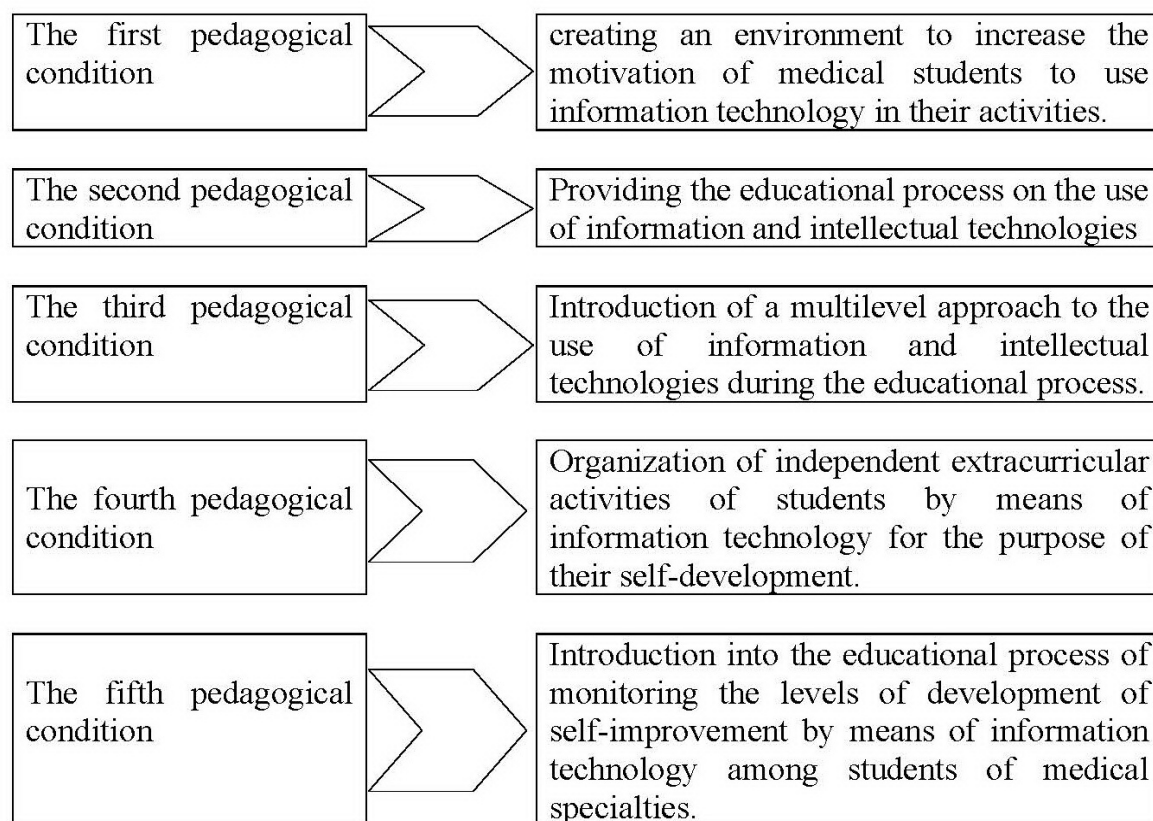


Figure 1 Classification of pedagogical conditions

The first pedagogical condition is the formation of an environment aimed at increasing the motivation of medical students to use information technology in education and professional activities.

Motivation of medical students to use information and intellectual technologies

in teaching and professional activities has two important components:

1) intrinsic motivation of medical students – a stable motive to "keep up with the times" – is directly related to the content of professional activities and is based on the persistent need to use modern information and intellectual technologies in medicine to optimize doctors, information systems to improve quality and the effectiveness of medical care for patients;

2) external motivation of medical students to use information and intellectual technologies is due to circumstances that are not directly related to professional activities, such as the need for self-improvement, self-affirmation, social prestige, financial well-being, motives for recognition by the medical and scientific community.

Thus, the motivation of professional self-improvement of a specialist is a set of all motivations and conditions that determine, guide and regulate the process of professional self-improvement. Professional self-improvement is based on a rather complex system of motives and is due to various sources of activity. The driving force and leading source of specialist development is the need for self-change and self-improvement, due to the contradictions between the motives of their own professional activities and the goal of achieving it in a renewed environment. Provide direction of the motive to the goal – means to cause a real need for self-improvement, taking into account the axiological approach.

The second pedagogical condition is the provision of the educational process by a staff of teachers with strong practical training in the use of information and intellectual technologies in the educational process. This condition is set in order to provide organizational and pedagogical support of the educational process in institutions of higher medical education, which provide training for medical students, aimed at forming the development of self-improvement of medical students using information technology. In distinguishing this pedagogical condition, we used a subjective approach and took into account the fact that the COVID-19 pandemic changed the pace and rhythm of life in all spheres of economic, spiritual, educational space. The spread of the disease has prompted governments around the world to turn the educational process into distance learning. Much of the world's higher education institutions have switched to distance learning. In Ukraine, distance learning has also been introduced in higher education institutions. Today, distance learning is one of the world's leading trends in education – this technology implements the principle of continuing education and is able to meet the ever-growing demand for knowledge in the information society.

Teachers of disciplines of the vocational training unit in a medical

institution of higher education are mostly not specialists in information and intellectual technologies, so they need special training in the use of information technology in the educational process.

Analysis of literary research and Internet resources shows that mostly scientists and educators-practitioners have developed problems of training practitioners and future teachers of various specialties in pedagogical institutions of higher education, teachers of higher technical, economic institutions of higher education, and special training of teachers of medical institutions of higher education. the use of information technology in the process of forming the development of self-improvement of medical students has not been thoroughly and systematically studied. In our opinion, the main reason is that such training is quite time consuming, requires the development of new methods and organizational forms of work with teachers, the search for which is just beginning, while developing models of such teacher training is extremely important.

The idea of the need for scientific and methodological training of teachers to use information technology in the educational process, which is based on acquired competencies in the use of information and intellectual technologies, is not new in itself. Moreover, for such preparation it is possible to use multimethodical materials from already existing and named by us techniques; certain courses, trainings, seminars, conferences, as well as various scientific articles, methodical materials, monographs, manuals, videos on YouTube offer Internet resources; useful are the services and resources of the Center for Computer Training "Semicom" <http://www.semi.com.ua/>, Center for Business Technology and Computer Training <http://kdm-kursi.com.ua/>, Center for Computer Training Perspectives of the XXI Century <http://www.xxi.kiev.ua/>, Center for Computer Training «Logos» <https://lgs.lviv.ua/>, which offer virtual learning, ie, distance learning preparation for the use of web technologies in the educational process. But it should be noted that such courses require a relatively long amount of time from teachers, are quite expensive, which should not be ignored, and they are largely focused on professional teachers in the field of computer technology.

Thus, the second proposed condition involves the organization of special scientific and methodological training of teachers to use web technologies in the educational process in the free economic zone, in particular, at its departments. Such training should be a holistic dynamic process of providing theoretical and practical assistance to teachers in using web technologies to organize training of medical students based on scientific achievements, best pedagogical experience and specific analysis of the educational process as a system of actions and activities aimed at training and development. professional skills of each teacher.

It is advisable to distinguish the following forms of special scientific and methodological training of teachers to use information technology in the educational process: individual, collective and self-educational, which differ only in the methods, techniques and methods used, but have one vector – improving professional skills of research and teaching staff medical freelance in general.

The individual form of training includes individual consultations, in particular, virtual (e-mail, chats, social networks, etc.) on the use of information technology, studying the experience of teachers of computer science, conversations, discussion of modern information and intellectual technologies in education, ways to create electronic educational and methodical complexes, electronic textbooks, manuals, a package of presentations or video lessons, etc. Collective form of training involves the organization and conduct of open classes with the use of information and intellectual technologies of mutual attendance of classes, workshops, express courses such as «Information technologies in the educational process», methodical councils, scientific-methodical seminars, pedagogical readings, scientific-practical conferences, in particular, Internet conferences, creation of creative groups (up to 10 people) from theoretically and practically trained teachers who will work on development. solving the problem of using information technology in the educational process to shape the development of self-improvement of future family doctors and will share experiences with other teachers of free economic education (faculty, department).

As part of the research problem, special scientific and methodological training of teachers for the use of information technology in the educational process involves the next stages, which are shown in Fig. 2.

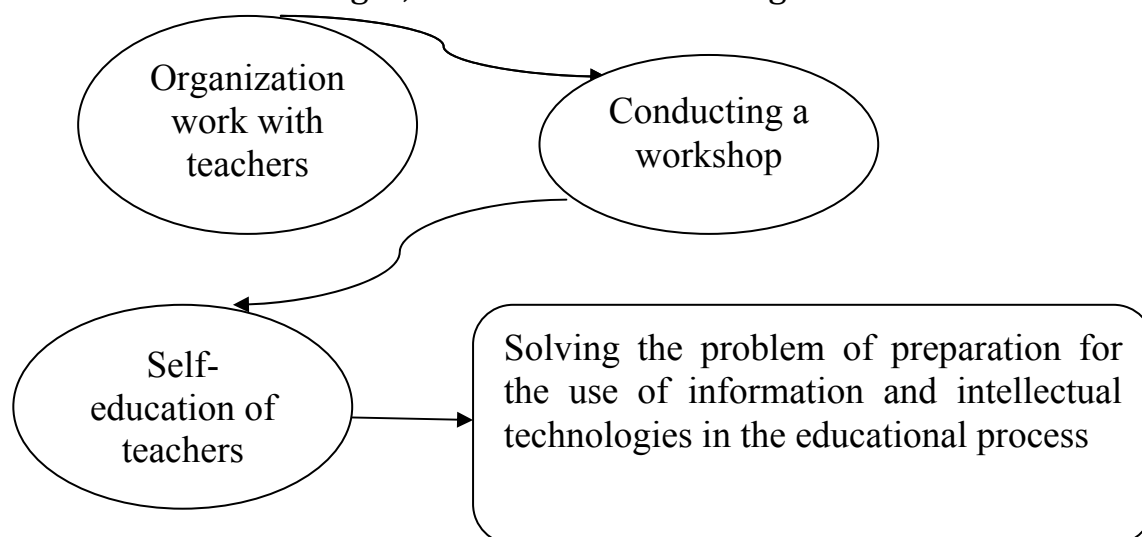


Figure 2 Scheme of teacher training for the use of information technology in the educational process

Note that the content of the workshop (topics «Professional competence of the teacher. Scientific and methodical work in medical free educational institutions», «Organization of information and educational environment in the educational institution», «The use of Internet resources in the organization of distance learning, independent (practical, extracurricular) work of students») was selected taking into account the solution of the following tasks:

- to promote the formation of teachers of medical HEI understanding of the need to use information technology in the modern educational process;
- to demonstrate on the example of specific web resources the role, importance and benefits of information and intellectual technologies that will be effective in shaping the development of self-improvement of medical students;
- to provide acquaintance of teachers with modern information and intellectual technologies and their didactic possibilities which it is expedient to use at full capacity in educational process of studying of disciplines of general and professional preparation.

The third pedagogical condition is the introduction of a multilevel approach to the use of information and intellectual technologies during the educational process.

In the previous question, we have already determined the levels of readiness of students of medical specialties of pre-technologies, namely: basic (reproductive), sufficient (heuristic), creative (creative).

Based on a personality-oriented approach, according to each of the levels we have unraveled a number of practical tasks using modern information and intellectual technologies for the development of self-improvement.

Task. Determine the arithmetic mean, standard deviation, error of representativeness, mode and median of the results of measuring the blood flow rate of 8 patients before anesthesia.

According to the levels:

- basic (reproductive) level – make calculations in a notebook using formulas;
- sufficient (heuristic) – partially use the software package MSExcel;
- creative – to solve the set goals you need to apply the statistical package of data analysis MSExcel.

The fourth pedagogical condition is the organization of independent extracurricular activities of students by means of information technology for their self-development.

The development and implementation of a specially developed program of extracurricular activities in the medical educational institution contributes to

the formation of the readiness of medical students for self-improvement by means of information and intellectual technologies. In the pedagogical dictionary «extracurricular work» is defined as specially organized and purposeful extracurricular activities aimed at deepening and expanding the knowledge gained in the educational process, the formation of creative interests, various skills and abilities. It should be noted that the role of information and intellectual technologies in the training of medical students is constantly growing, helping to increase interest in information and intellectual technologies, their use in professional activities, solving a wide range of research problems. Extracurricular activities of students with the use of information and intellectual technologies contribute not only to better preparation of ZVMO graduates for professional activities in the information society, but also to the formation of self-improvement of the specialist.

To organize this activity at the Department of Physical Rehabilitation and Information Technology of the Central Ukrainian Institute of Human Development VMURL «Ukraine» was created a student research group.

The main tasks of the student research group are:

- Involvement of medical students in active research work on problematic issues in the research program of the department;
- organization of research work of applicants for higher medical education;
- promoting the creative activity of students, the development of their skills and abilities in research activities;
- assistance to students in the realization of their internal needs in self-improvement, self-development, self-expression, respect, development of creative abilities;
- development of students' ability to organize and conduct scientific events with the involvement of a wide range of specialists in the field of medicine;
- providing students with the latest information on modern achievements of information and intellectual technologies in medicine, to exchange information between students on research topics.

International conferences, round tables and seminars on the topic: «The use of modern information technology in the diagnosis and treatment of socially significant diseases» and «Medical rehabilitation of various diseases using information and intellectual technologies», «Current issues and prospects for diagnosing diseases» and others. Thus, by involving students in scientific circles, international and national conferences, round tables and seminars will encourage future professionals to use information and intellectual technologies for their self-development.

The fourth pedagogical condition is to ensure the active use by students of the programs ICD-10, ISRS-2 and «Small Expert System 2.0».

The International Statistical Classification of Diseases (ICD-10) is the main tool for statistical development of information on public health and the activities of health care facilities. Its application ensures the unity of collection and the ability to compare data on public health, the prevalence of diseases and their epidemiology, both within one country and in different countries.

For example, the use of ICD-10 codes in the coding of patients with suspected or confirmed COVID-19: U07.1 «2019-nCoV Acute Respiratory Disease» – is used as a concomitant diagnosis with the status of «final» for confirmed cases. Situational recommendations for coding in ICD-10 and ISRS-2.

Situation. The patient returned from the country where COVID-19 was detected. There are no symptoms, but the patient is afraid of getting the coronavirus, so he calls the family doctor to determine further action. The family doctor consulted and pointed out the further algorithm of action (self-isolation and monitoring of the general condition, in case of deterioration of health, notify either the family doctor or call 103 when there is fever, dry cough and difficulty breathing).

With the help of the «Small Expert System» programs, students get acquainted with the basic principles of the expert system, which are designed to consult with the user in any application area (for which the downloaded knowledge base is configured) to determine the likelihood of possible results. able to identify the disease, give its description, symptoms and treatment methods.

The fifth pedagogical condition is the introduction into the educational process of monitoring the levels of development of self-improvement by means of information technology among students.

Monitoring in education is a special system of collecting, processing, storing and disseminating information about the state of education, forecasting on the basis of objective data on the dynamics and main trends of its development and developing scientifically sound recommendations for management decisions to improve the efficiency of education.

In the context of our study, taking into account the activity approach, monitoring the levels of development of self-improvement by means of information technology among students, we can implement through testing.

For example, from the following benefits, choose one that does not apply to screening diagnostic systems: a) efficiency; b) complete replacement of the inspection process; c) obtaining information about the condition of only one patient; d) saving time; e) use of high-cost equipment.

Adherence to the selected pedagogical conditions contributes to the teacher's

awareness of their professional nature, effective self-improvement, self-realization and self-actualization, when a high school teacher becomes the creator of their life and professional circumstances, self-determination in professional activities.

CONCLUSIONS AND PROSPECTS FOR FURTHER RESEARCH / ВИСНОВКИ ТА ПЕРСПЕКТИВИ ПОДАЛЬШИХ ДОСЛІДЖЕНЬ / ВЫВОДЫ И ПЕРСПЕКТИВЫ ПОСЕДУЮЩИХ ИССЛЕДОВАНИЙ

Thus, having analyzed the different points of view of researchers regarding the interpretation of this phenomenon, it is obvious that the pedagogical conditions in the context of our study have not yet been considered. Therefore, based on the analysis of a number of achievements and our own practical experience, we determine the pedagogical conditions for the development of self-improvement of medical students by means of information and intellectual technologies as a set of interdependent and interdependent information factors and methodological measures of the pedagogical process, purposeful formation of components of pedagogical competence in future specialists and, as a result, – improvement of quality of development of self-improvement to future professional activity.

Prospects for further research. To address the implementation of information and intellectual technologies for self-improvement of medical students allows to find ways to address the issue of providing, to a large extent, students of academic freedom and mobility. Information and intellectual technologies expand the educational space of higher education institutions and will attract leading specialists from other educational and research institutions to train students of medical specialties, interns and professional development of teaching staff.

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САМОВДОСКОНАЛЕННЯ СТУДЕНТІВ МЕДИЧНИХ СПЕЦІАЛЬНОСТЕЙ ЗАСОБАМИ ІНФОРМАЦІЙНИХ ТА ІНТЕЛЕКТУАЛЬНИХ ТЕХНОЛОГІЙ

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Анотація. У даному дослідженні обґрунтовано педагогічні умови формування самовдосконалення студентів медичних спеціальностей засобами інформаційних та інтелектуальних технологій. Розглянуто сучасну освітню парадигму, яка спрямована на пошук інноваційних підходів щодо

науково обґрунтованого та послідовного організаційно-педагогічного забезпечення її розвитку. Визначено, що одним із шляхів реалізації поставлених завдань є послідовне запровадження ефективних педагогічних умов, які забезпечать готовність студентів медичних спеціальностей до розвитку самовдосконалення засобами інформаційних технологій. Проаналізовано різні точки зору дослідників стосовно трактування даного феномену. Визначено основні підходи щодо науково-методичної підготовки викладачів до використання інформаційних технологій в освітньому процесі, а також досліджено педагогічні умови при формуванні середовища націленого на посилення мотивації студентів медичних спеціальностей до використання інформаційних та інтелектуальних технологій в навчанні та професійній діяльності. Виходячи з аналізу цілої низки доробків та з власного практичного досвіду визначаємо педагогічні умови розвитку самовдосконалення студентів медичних спеціальностей засобами інформаційних та інтелектуальних технологій як комплекс взаємообумовлених і взаємозалежних інформаційних чинників та методичних заходів педагогічного процесу, що забезпечують оновлення змісту навчання, застосування новітніх методик й технологій, цілеспрямоване формування у майбутніх фахівців компонентів педагогічної компетентності та, як результат, – підвищення якості розвитку самовдосконалення до майбутньої професійної діяльності. Зазначено, що інформаційні та інтелектуальні технології розширюють освітній простір закладів вищої освіти та дозволяють залучати провідних спеціалістів з інших навчальних та дослідницьких установ для навчання студентів медичних спеціальностей, інтернів та підвищення кваліфікації професорсько-викладацького складу.

Ключові слова. педагогічні умови; самовдосконалення; мотивація; інформаційні та інтелектуальні технології; професійна підготовка; освітній процес.

САМОСОВЕРШЕНСТВОВАНИЕ СТУДЕНТОВ МЕДИЦИНСКИХ СПЕЦИАЛЬНОСТЕЙ СРЕДСТВАМИ ИНФОРМАЦИОННЫХ И ИНТЕЛЛЕКТУАЛЬНЫХ ТЕХНОЛОГИЙ

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Аннотация. В данном исследовании обоснованы педагогические условия формирования самосовершенствования студентов медицинских специальностей средствами информационных и интеллектуальных технологий. Рассмотрена современная образовательная парадигма, которая направлена на поиск инновационных подходов относительно научно обоснованного и последовательного организационно-педагогического обеспечения ее развития. Определено, что одним из этих путей есть реализация поставленных задач, что является последовательное введение эффективных педагогических условий, которые обеспечат готовность студентов медицинских специальностей к развитию самосовершенствования средствами информационных технологий. Определены основные подходы к научно-методической подготовки преподавателей к использованию информационных технологий в образовательном процессе, а также исследованы педагогические условия при формировании среды, направленной на усиление мотивации студентов медицинских специальностей к использованию информационных и интеллектуальных технологий в обучении и профессиональной деятельности. Исходя из анализа целого ряда доработок и собственного практического опыта определяем педагогические условия развития самосовершенствования студентов медицинских специальностей средствами информационных и интеллектуальных технологий как комплекс взаимообусловленных и взаимосвязанных информационных факторов и методических мероприятий педагогического процесса, обеспечивающих обновление содержания обучения, применение новейших методик и технологий, целенаправленное формирование у будущих специалистов компонентов педагогической компетентности и, как результат, повышение качества развития самосовершенствования к будущей профессиональной деятельности. Отмечено, что информационные и интеллектуальные технологии расширяют образовательное пространство заведений высшего образования и позволят привлекать ведущих специалистов из других учебных и исследовательских учреждений для обучения студентов медицинских специальностей, интернов и повышения квалификации профессорско-преподавательского состава.

Ключевые слова: педагогические условия; самосовершенствование; мотивация; информационные и интеллектуальные технологии; профессиональная подготовка; образовательный процесс.

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*Стаття надійшла до редакції
17 квітня 2022 року*