INNOVATIVE TECHNOLOGIES IN THE ADVANCEMENT OF HIGHER MEDICAL EDUCATION

ІННОВАЦІЙНІ ТЕХНОЛОГІЇ В ПРОГРЕСУВАННІ ВИЩОЇ МЕДИЧНОЇ ОСВІТИ

УДК 378.001.004.031:61
DOI https://doi.org/10.32843/2663-6085/2020/22-4.37

Shuper V.O.,
Candidate of Medical Sciences,
Associate Professor of the Department of Internal Medicine, Clinical Pharmacology and Occupational Diseases
Bukovinian State Medical University
Shuper S.V.,
Candidate of Medical Sciences,
Associate Professor of the Department of the Physical Rehabilitation and Ergotherapy
Yuriy Fedkovych Chernivtsi National University
Husak V.V.,
Candidate of Medical Sciences,
Associate Professor of the Department of the Physical Rehabilitation and Ergotherapy
Yuriy Fedkovych Chernivtsi National University
Temerivska T.G.,
Candidate of Medical Sciences,
Associate Professor of the Department of the Physical Rehabilitation and Ergotherapy
Yuriy Fedkovych Chernivtsi National University
Rykova Y.O.,
Candidate of Medical Sciences,
Associate Professor of the Department of Human Anatomy
Kharkiv National Medical University

The work analyzes the theoretical and practical features of modern innovative pedagogical technologies, as well as suggests ways of their effective application in higher medical education. The main target of the reform of higher medical education is the formation of new medical personnel through the introduction of European medical and scientific standards into the educational and integration process and the improvement of the intellectual, scientific and educational, professional-oriented level of future doctors, providing them with modern, more effective innovative and informational medical technologies.

Purpose of the investigation was to analyze the efficiency of use of the innovative potential in modern higher medical education in the conditions of globalization of educational process. Informatization of society is one of the regularities of the modern progress of medical education. At the same time, the main consideration focuses on the set of measures aimed at ensuring the full use of reliable, comprehensive and timely knowledge in all types of human activities. While using the traditional learning technologies, it is difficult to achieve a number of professional education goals.

Thus, efficacy of student learning will be improved significantly with the use of interactive methods extending the borders of creative activity of both teacher and student. It may form the critical thinking, skills of independently acquiring and controlling knowledge, confident navigation in the educational space. Further development requires the disclosure of the influence of information and communication technologies on the development of creative potential of the individual. The introduction of distance learning and advanced training facilitates the optimization and unification of the educational process at the university, the specialization of teachers in using of innovative programs and the implementation of the principles of globalization of higher education. The main task of higher medical educators is to include modern technologies effectively to transform studying into a more collaborative, personalized, and wide experience.

Key words: *higher medical education, innovative technologies, globalization of studying, educational space, European Community Course Credit Transfer System (ECTS).*

У роботі аналізуються теоретичні та практичні особливості сучасних інноваційних педагогічних технологій, а також пропонуються шляхи їх ефективного застосування у вищій медичній освіті. Основна мета реформи вищої медичної освіти – формування нового медичного персоналу через упровадження європейських медичних і наукових стандартів у навчально-інтеграційний процес і вдосконалення інтелектуального, наукового й освітнього, професійно-орієнтованого рівня майбутніх лікарів через забезпечення їх сучасними, більш ефективними інноваційними та інформаційними медичними технологіями.

Метою дослідження є аналіз ефективності використання інноваційного потенціалу в сучасній вищій медичній освіті в умовах глобалізації навчального процесу. Інформатизація суспільства є однією із закономірностей сучасного прогресу медичної освіти. При цьому основна увага приділяється сукупності заходів, спрямованих на забезпечення повного використання надійних, усебічних і своєчасних знань у всіх видах людської діяльності. Використовуючи традиційні технології навчання, важко досягти низки цілей професійної освіти.

Отже, ефективність навчання студентів буде значно покращена із застосуванням інтерактивних методів, що розширюють межі творчої діяльності як учителя, так й учня. Це допоможе сформувати критичне мислення, навички самостійного оволодіння знаннями та контролю знань, упевнену навігацію в освітньому просторі. Подальшого розвитку вимагає розкриття впливу інформаційно-комунікаційних технологій на прогресування творчого потенціалу особистості. Упровадження дистанційного навчання та безперервного підвищення кваліфікації сприяє оптимізації й уніфікації навчального процесу, спеціалізації викладачів із використання інноваційних програм і реалізації принципів глобалізації вищої освіти. Основним завданням викладачів вищих медичних закладів освіти є ефективне включення сучасних технологій для отримання студентами в ході навчання більш спеціалізованого, персоналізованого та широкого досвіду.

Ключові слова: *вища медична освіта, інноваційні технології, глобалізація навчання, освітній простір, Європейська кредитна трансферно-накопичувальна система (ЄКТС).*

Topicality. Medical education of tomorrow's physicians for the work at the peak of their abilities must be progressive and innovative, moving beyond classical curricula and pedagogical approaches to meet the theoretical needs and practical skills of a new generation of students. The restructuring of the educational process widely using of innovative information and telecommunication technologies becomes a basis of implementing a radical economic reforms and building a qualitatively new education system in Ukraine. The changes taking place in the development of the Ukrainian, science and education reforms require a thorough training of specialists who are capable of ensuring a qualitative transition from the industrial to the innovation and information society through innovation in education, scientific and methodological work. Moreover, this postulate directly concerns higher medical education.

Foreign and domestic experience shows that solving the task of building a modern competitive economy and knowledge society requires the optimal use of the latest models of innovative processes, where

research innovation universities become an important component. Such higher education institutions, working in close partnership with the state and local government and subjects of the economic activity, are increasingly turning into centers of innovation development, achieving significant acceleration of the processes of implementation of research and development in technology, goods and services demanded by modern economy [10, p. 38].

The main target of the reform of higher medical education is the formation of new medical personnel through the introduction of European medical and scientific standards into the educational and integration process and the improvement of the intellectual, scientific and educational, professional-oriented level of future doctors, providing them with modern, more effective innovative and informational medical technologies [14, p. 4].

Analysis of recent research. The history of the emergence of innovation in education is associated with the development of experimental pedagogy (second half of the nineteenth century), the doctrine of studying the psychological characteristics of children, the newest forms and the content of their teaching and education by methods of scientific research. The main ideas of foreign scientists of that time were the need to abolish educational traditions and proclaim the priority of creative development of the child [17, p. 5].

The principal purpose of the introduction of innovations in education at the end of the XX – beginning of the XXI century became the necessity to respond to the challenges of globalization transformations, environmental problems, and multicultural tendencies in the world. New ideas centered on the problem of quality of the education, the formation in teachers the individual responsibility for positive changes in that, the activation of socio-pedagogical processes to improve its quality [15, p. 122; 18, p. 324]. The most significant achievements in any field of production or economy will not find their practical application without the presence of skilled performers of this job. Therefore, the system of higher education receives the special significance in the implementation of state policy focusing on industrial restructuring and the development of an individual model of economic growth, as well as admission of Ukraine as a high-tech country [5, p. 314].

The process of informatization of the education acquired the purposeful nature of national significance with the adoption of the Law of Ukraine "On the Concept of the National Program of Informatization" (1998) [18, p. 240] as well as the Law of Ukraine "On the Basic Principles of the Development of Information Society Societies in Ukraine for 2007–2015" [8, p. 2004].

There is no monosemantic definition of innovation in the modern literature. This category is mostly interpreted as transforming potential scientific and technological progress into real one, which is incarnating in new products and technologies. In a broad sense, innovations are considered as profitable use of ideas, inventions in the form of new products, services, organizational, technical and socio-economic decisions of the production, financial or commercial nature. The complex of scientific, technological and organizational changes is defined by researchers as an innovation process, and the period of creation and commercialization is called the innovation cycle [17, p. 3]. Thus, the coverage of actual problems in the teaching of any disciplines in higher educational institutions is intended to help the teacher to efficiently organize the learning process in accordance to the state educational standard, the main regularities and the newest trends in the field of pedagogy, psychology, medicine, etc. [6, p. 79].

The innovative methods include active learning. It is known that in the process of passive perception, a person will remember 10% from what he read, 20% from what he heard, 30% from what he saw, 50% from what he saw and heard, while in the active perception one's memory keeps 80% from what he say and 90% from what he does on his own. Consequently, we can conclude that the methods of active learning greatly improve the memorization of the subject, facilitate its identification and purposeful practical implementation [12, p. 215].

The significant demand of changes in the medical education system is based on two factors: a prominent increase in the volume of medical information and a rapid scientific progress in the understanding of medical facts, phenomena, etc. The explosion of medical knowledge no longer allows physicians to keep in their mind all knowledge that is necessary to provide quality patient care. Therefore, the informatization of continuous medical education should become the principal platform of these changes, especially in the context of the current reform of the medical sphere [13, p. 84; 19, p. 262].

Purpose of the investigation was to analyze the efficiency of use of the innovative potential in modern higher medical education in the conditions of globalization of educational process.

The main material. The educational goals of using technology in medical education include facilitating basic knowledge acquisition, improving decision making, enhancement of perceptual variation, improving skill coordination, practicing for rare or critical events, learning team training, and improving psychomotor skills. Different technologies can address these goals [19, p. 263].

Informatization of society is one of the regularities of the modern progress of medical education. At the same time, the main consideration focuses on the set of measures aimed at ensuring the full use of reliable, comprehensive and timely knowledge in all types of human activities. While using the traditional learning

technologies, it is difficult to achieve a number of professional education goals. There are the formation of professional motives and interests, systemic specialist's thinking, holistic view of professional activity. Very important skills and knowledge include also team mental and practical work, collective interaction and communication, individual and joint decision-making; mastering the methods of modeling and designing. The key factor here is the progress in IT that provide access to the global information space for each student. Successful use of computers in education requires efforts not only from students but also from teachers, as well as the integration of information technology into the educational process. Computer equipment also allows implementing a variety of learning methods. It contributes to the success of learning, presents information in many different forms, personalizing it much more effectively, and gives impressive results. Herewith, the assimilation of fundamental and clinical medical disciplines is progressively improved, rising the motivation to study and social development of students [3, p. 15; 4, p. 7; 16, p. 79].

One of the most effective education technologies is the modular one, which is based on the following principles: quantum, problem, modularity, parity. All these principles are conditioned by the general theory of fundamental systems, which is the methodological basis of learning technology [2, p. 159].

However, after becoming valid in 2014 the Law of Ukraine "On Higher Education" by the Ministry of Education and Science of Ukraine, the credit-modular system of education is abolished as a compulsory course of higher educational institutions. According to the Law, the European Community Course Credit Transfer System (ECTS) is being implemented into the higher education system of Ukraine. This is the system is used in the European Higher Education Area and facilitates the academic mobility of higher education graduates. The system is based on the definition of the studying load needed to achieve the defined learning outcomes and is calculated in ECTS credits. ECTS credit is a unit of measurement of the academic load of a higher education applicant required to achieve identified (expected) learning results. The state policy of Ukraine in the field of higher education is based on the principles of international integration and integration of the higher education system of Ukraine into the European higher education area, with the achievements and progressive traditions of the national higher school, which are preserved and developed [8, p. 2004].

In addition to modular higher education, another very effective remote learning technology through the Internet is widely provided. Technologies such as electronic universities, academies, schools, libraries, training portals, educational electronic resources;, virtual round tables, seminars, conferences, symposiums, lectures, practical classes, laboratory works, work-shops have become popular. Multimedia and interactive learning tools, in addition to traditional forms, can enhance the quality of education by using of modern computer technologies (educational CDs, E-books, atlases, presentations, films, MCQs) in the educational process [11, p. 124; 13, p. 86].

However, now the simulation technologies play the important role in the modern medical education. The learning characteristics of simulation include conducting feedback, repeating practice, curriculum integrations and graduation of difficulty levels, different learning strategies and capture of clinical differences, individual learning, and the ability to define outcomes or final estimation. The aim of simulation is to imitate real patients, anatomic regions, or clinical tasks, and/or mirror the real-life circumstances in which medical services are rendered. Simulations can fulfill a number of educational goals. A well-structured case in the simulation center can teach and assess many, if not all, of the patient and process-centered skills, as well as team involvement and management [19, p. 264].

The efficacy of innovative pedagogical technologies also depends on the teacher's skill of proper organization of the educational process. Innovative technologies are often a combination of several learning methods, which allows for a comprehensive renewal of the educational process. The combination of two modern technologies (informational and modular) creates innovative one, which, on the one hand, provides computer-based learning support (information technology), and on the other hand, provides individualized learning (modular technology).

The combination of technological processes in the form of new information and modular technologies will facilitate the creation of a technology called "information-modular", the main purpose of which is to update the educational process of the higher educational institution [1, p. 9]. However, the use of technology in medical education should be to support but not a replacement for face-to-face learning. Educators must still focus on the principals of teaching, not only on the specific technologies. Technologies are just one tool in the educational toolbox [19, p. 265].

Conclusions. The presented modern data unequivocally show the necessity of the comprehensive application of innovative programs in all types and branches of education, but the processes of globalization and informatization gain the greatest importance in the field of higher education. The peculiarity of medical higher education is conditioned be the demand of introducing innovations into the educational process while preserving the basic teaching methods of conducting of the real patient in a real clinical situation.

Efficacy of student learning will be improved significantly with the use of interactive methods extending the borders of creative activity of both teacher and student. It may form the critical thinking, skills of

independently acquiring and controlling knowledge, confident navigation in the educational space.

The introduction of distance learning and advanced training facilitates the optimization and unification of the educational process at the university, the specialization of teachers in using of innovative programs and the implementation of the principles of globalization of higher education.

Further development requires the disclosure of the influence of information and communication technologies on the development of creative potential of the individual.

The main task of higher medical educators is to include modern technologies effectively to transform studying into a more collaborative, personalized, and wide experience.

REFERENCES:

1. Аймедов К.В., Сердюк Н.М. Застосування інноваційних технологій навчання у системі вищої освіти. *Молодий вчений.* 2015. № 2 (17). С. 8–10.

2. Алфімов Д.В. Інноваційна освітня система вищої школи: шляхи відродження. *Педагогічні інновації: ідеї, реалії, перспективи :* збірник наукових праць. 2000. С. 158–160.

3. Величко Е.В. Психолого-педагогические проблемы информатизации образования в условиях глобализации. *Актуальные вопросы современной психологии :* мат. Междунар. заоч. науч. конф. Челябинск, 2011. С. 15–17.

4. Вороненко Ю.В., Мінцер О.П. Реформування системи медичної освіти в світлі концепції «суспільство знань». *Український медичний часопис.* 2006. № 1 (51). С. 6–13.

5. Высшее образование Украины. *Высшее образование Украины в контексте интеграции к европейскому образовательному пространству :* тематический выпуск. 2008. Приложение 3. Том IV (11). 638 с.

6. Дингилиши У.В. Образование в аспекте глобализации и информатизации. *Успехи современного естествознания.* 2005. № 1. С. 79–80.

7. Дичковская И.М. Инновационные педагогические технологии. Киев : Академиздат, 2004. 352 с.

8. Про вищу освіту : Закон України від 01.07.2014 № 1556-VII зі змінами від 14.07.2016 № 1415-VII. Відомості Верховної Ради України. 2014. № 37–38. С. 2004.

9. Про основні засади розвитку інформаційного суспільства в Україні на 2007–2015 роки : Закон України. *Право*. 2007. № 21 (4021). С. 7–10.

10. Артьомов І.В., Студеняк І.П., Головач Й.Й. Інновації у вищій освіті: вітчизняний і зарубіжний досвід : навчальний посібник. Ужгород : ПП «АУТДОР-ШАРК», 2015. 360 с.

11. Кремень В.Г. Освіта і наука України: шляхи модернізації (Факти, роздуми, перспективи). Київ : Грамота, 2003. 216 с.

12. Майхнер Х.Е. Корпоративные тренинги. Москва : ЮНИТИ, 2002. 354 с.

13. Минцер О.П. Информатизация медицинского образования. *Український медичний часопис*. 2003. № 5 (37). С. 83–89.

14. Мороз В.М., Гумінський Ю.Й., Фоміна Л.В. Проблеми та перспективи вищої медичної освіти у реалізації Національної стратегії реформування системи охорони здоров'я України. *Проблеми та перспективи вищої медичної школи у розробці та реалізації Національної стратегії побудови нової системи охорони здоров'я в Україні на період 2015–2025 рр. :* тези доповідей навч.-метод. конференції, м. Вінниця, 25.03.2015. Вінниця, 2015. С. 3–6.

15. Навроцький О.І. Вища школа України в умовах трансформації суспільства. Харків : Основа, 2000. 240 с.

16. Парахонский А.П., Венглинская Е.А. Технологии медицинского образования на основе компьютерной техники. *Современные наукоемкие технологии*. 2008. № 6. С. 79.

17. Тверезовська Н.Т. Теоретичні та методичні основи розробки і впровадження інноваційних технологій у навчальний процес вищої школи. *Проблеми освіти :* наук.-метод. збірник / М-во освіти і науки України, Ін-т інновац. технологій і змісту освіти. Київ, 2007. Вип. 47. С. 3–7.

18. Энциклопедия образования / Акад. пед. наук Украины ; под ред. В.Г. Кремень. Киев: Юринком Интер, 2008. 1040 с.

19. Guze P.A. Using Technology to Meet the Challenges of Medical Education. *Transactions of the American Clinical and Climatological Association.* 2015. № 126. P. 260–270.