INNOVATIVE TECHNOLOGIES AND TEACHING METHODS IN HIGHER EDUCATION: PROBLEMS AND PERSPECTIVES

Abstract. This article presents interactive and innovative methods, innovative technologies in education, which ensure optimization of the learning process, increase its quality and contribute to the integration of theory and practice. Presenting interactive and innovative methods and technologies in higher education, the authors offer ways to solve these problems, give a brief analysis of each method and technology and recommendations for their use. In addition, the socio-economic situation in Ukraine is changing. Therefore, there is a need to modernize education, rethink theoretical approaches and the accumulated practical experience of higher educational institutions. Pedagogical innovations contribute to the realization of these priority requirements, which became the goal of our research.

It was determined that the first generation of educational technologies, in particular computer learning technologies, was represented by traditional methods. The first generation includes a disciplinary-oriented model in which the computer technology of learning is considered as a holistic educational process based on traditional content, forms and methods of learning. It is supported by classic textbooks, problem books and methodical manuals. The computer in this model is used to present ready-made knowledge and strengthen control over its assimilation.
An important and characteristic feature of the traditional education system is its educational and disciplinary structure, when a complete picture of the world in a person who has gone through such an education system is formed not through knowledge of the realities of the surrounding world, but from dry knowledge of sciences corresponding to various educational disciplines. Thus, computer technologies of the first generation turned out to be unstable systems due to existing contradictions between the requirements of the traditional education system and the unused capabilities of the computer. The second generation refers to the transitional model, and computer-based learning technology is presented as a controversial educational composition based on traditional content, which, however, uses an unsystematized combination of classical and modernized forms and methods of learning.

**Keywords:** innovative teaching methods, interactive teaching methods, technologies, innovative technologies, Internet technologies, blended learning, tutors.

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технології у вищій освіті, автори пропонують шляхи вирішення даних проблем, дають короткий аналіз кожної методу і технології та рекомендації до їх застосування. Крім того, змінюється соціально-економічна ситуація в Україні. Відтак виникає необхідність модернізації освіти, переосмислення теоретичних підходів і накопиченого практичного досвіду роботи вищих навчальних закладів. Реалізації цих пріоритетних вимог сприяють педагогічні інновації, що і стало метою нашого дослідження.

Визначено, що перше покоління освітніх технологій, зокрема комп’ютерних технологій навчання, було представлено традиційними методами. До першого покоління відноситься дисциплінарно-орієнтована модель, у якій комп’ютерна технологія навчання розглядається як цілісний освітній процес, заснований на традиційному змісті, формах і методах навчання. Підкріплюється класичними підручниками, задачниками та методичними посібниками. Комп’ютер у цій моделі використовується для подання готових знань і посилення контролю за їх засвоєнням.

Важливою і характерною рисою традиційної системи освіти є її навчально-дисциплінарна структура, коли цілісна картина світу в людини, яка пройшла через таку систему освіти, формується не через знання реалій навколишнього світу, а з сухі знання про науки, відповідні різним навчальним дисципліналам. Таким чином, комп’ютерні технології першого покоління виявилися нестабільними системами через існуючі протиріччя між вимогами традиційної системи освіти та невикористаними можливостями комп’ютера. Друге покоління відноситься до перехідної моделі, і комп’ютерна технологія навчання представлена як суперечлива навчальна композиція, заснована на традиційному змісті, яка, однак, використовує несистематизоване поєднання класичних і модернізованих форм і методів навчання.

**Ключові слова:** інноваційні методи викладання, інтерактивні методи викладання, технології, інноваційні технології, інтернет-технології, змішане навчання, тьютори.

**Formulaition of the problem.** The traditional training of specialists, focused on the formation of knowledge, abilities and skills in a certain field, does not meet modern requirements today. The educational space needs a high-quality specialist associated with the goals of the Bologna Process - academic mobility. recognition of diplomas, introduction of credit systems, invariant learning technologies and knowledge management.

**Analysis of research and publications.** The search for a solution to the pedagogical problems of innovation is closely related to the analysis of the already existing results of research into the essence, structure, classification and peculiarities of the flow of innovative processes in the field of education. At the theoretical and methodological level, the problem of innovations is most fundamentally reflected in the works of M. Potashnyk, A. Khutorskyi, N. Pugacheva, V. Lazarev, and V. Zagvyazynskyi.
The technological approach to education is actively developed in the research of V. Bespalka, M. Bershadskyi, V. Guzeev, M. Klaryn, H. Selevka, A. Uman and other scientists. G. Andreyeva, S. Arkhangelskyi, V. Bespalko, G. Selevko made a significant contribution to the development of innovative technologies used for the formation of professional skills of higher education students. A number of studies have already been conducted that reveal the methodical and technological aspects of distance learning. The works of A. Andreev, D. Bogdanova, A. Bershadskyi, B. Gershunskyi, M. Masovoi, V. Makarov, O. Polat, A. Uvarov, and M. Chvanov are devoted to this problem.

The purpose of our article is interactive and innovative methods and technologies in higher education and solving these problems.

Summary of the research results. As already mentioned, various educational and pedagogical technologies began to be widely used in pedagogical practice in recent decades. Although it is known that the opinion about the technologization of the learning process was expressed by J. Comenius almost 400 years ago, calling to make learning "technical", i.e. in such a way that everything taught would be successful. Society is undergoing rapid and fundamental changes in various spheres of its activity. The roots of many changes lie in new ways of creating, storing, transmitting and using information. The new requirements of society for the level of education and personal development lead to the need to change learning technologies.

Pedagogical technology is usually called the direction of foreign pedagogy, which aims to increase the efficiency of the educational process, guaranteed achievement of planned learning outcomes by students. The phrase "pedagogical technology" itself is an inaccurate English translation of an educational technology. With the help of technology, intellectual information is translated into the language of practical solutions. Technology is both methods of activity and how a person participates in activity. "Any activity can be either technology or art. Art is based on intuition, technology is based on science. Everything starts with art, ends with technology, so that the whole process starts again." Modern technologies in education are considered as a means by which a new educational paradigm can be implemented.

In UNESCO documents, the teaching technology is considered as a systematic method of creation, application and definition of the entire process of teaching and assimilation of knowledge, taking into account technical and human resources and their interaction. This definition of technology, like many similar to it, cannot claim to be complete and accurate, despite the fact that new (environmental, space, information) technologies are constantly appearing. In the most general form, technology is a well-thought-out system, "how" and "in what way" the goal is embodied in a "specific type of product" its constituent part. For example, from the scientific and methodical literature, we will name some variants of the definition of technology: technical method of research of practical goals; a set
of methods used to obtain objects necessary for human existence; a set of procedures and methods of organizing human activity; tools used to model human behavior [2-8]. In modern pedagogy, there are many approaches to the concept of "pedagogical and educational technology", "methodology", "method", "pedagogical technique". In this regard, teachers do not always accurately identify the concepts in question. There are more than 150 such definitions in the domestic literature alone, but they lack an understanding of the category "pedagogical technology". Among them, the following definitions are most often found: 1. Procedural implementation of the components of the pedagogical process in the form of a system of actions (that is, technology is a process in which a sequence of actions is planned).

2. Pedagogical system presented in the form of sets of pedagogical techniques.

3. Design and implementation of the training project in practice.

The trends in the development of educational technologies are directly related to the humanization of education, which contributes to the self-actualization and self-realization of the individual. The term "educational technologies" is more comprehensive than "teaching technologies", because it also implies an educational aspect related to the formation and development of personal qualities of students. The classification of learning technologies is carried out on various grounds, but today there is no universally recognized classification. An important role is given to aesthetic education [1] distinguishes the following groups of modern educational technologies: according to the leading factor of mental development: biogenic, sociogenic, psychogenic and idealistic technologies; by orientation to personal structures, information technologies, operational, emotional-artistic and emotional-moral, self-development technology, heuristic and applied technologies; by the nature of content and structure, technologies that teach and educate, secular and religious, general education and professionally oriented, humanitarian and technocratic, etc. Each pedagogical epoch gives birth to its generation of technologies. The first generation of educational technologies, in particular computer learning technologies, was represented by traditional methods. The first generation includes a disciplinary-oriented model in which computer-based learning technology is considered as a holistic educational process based on traditional content, forms and methods of learning. It is supported by classic textbooks, problem books and methodical manuals. The computer in this model is used to present ready-made knowledge and strengthen control over its assimilation. An important and characteristic feature of the traditional education system is its educational and disciplinary structure, when a complete picture of the world in a person who has gone through such an educational system is not formed through knowledge of realities of the surrounding world, but from rather dry knowledge about the sciences corresponding to various academic disciplines. Thus, the computer technologies of the first generation turned out to be unstable systems due to the existing contradictions between the requirements of the traditional education system and the unused capabilities of the computer. The second generation belongs to the
transitional model, and computer-based learning technology is presented as a contradictory educational composition based on traditional content, which, however, uses a non-systematized combination of classical and modernized forms and methods of learning. It is supported by traditional textbooks, problem books and methodical guides, as well as modern computer programs and educational environments, mainly oriented to the processes of comprehensive research of models of the real world. Computer technology of the second generation of education is an unstable system, as it is basically designed for disciplinary-oriented system, and by its superstructure gravitates towards an interdisciplinary object-oriented system of learning. But at the same time, the appearance of such learning technologies indicates that there is a natural "germination" of new object-oriented educational models, which lay the foundation for a new system of science education. In this system, instead of studying individual subjects, there are examples of interactive educational work with integral objects of the surrounding world, for example, with seas and oceans, the solar system, etc. But for now, the selection of these objects and their corresponding models remains random. They cannot capture a complete picture of the surrounding world, because they are created by separate, unrelated groups of developers in the absence of any unifying ideology, but at the same time they are prerequisites for the third generation of computer education. The project-oriented model belongs to the third generation, and learning technology is considered as a single educational process based on interdisciplinary non-traditional content, forms, methods and means of learning. It is supported by textbooks of a new type and special design educational computer environments, which include databases and tools for learning about the whole surrounding world in the context of its computer design, modeling and construction. The computer technology of the third generation of education, based on its basis and superstructure, is intended for a project-oriented system of education, in the process of which not only control over the assimilation of knowledge is carried out, but primarily its active use for creation within the framework of the educational process. Therefore, the second and third generations are already modular-block, completely block learning systems.

In modern education, a significant place is given to the use of new information technologies, Internet technologies [8-14]. New information and telecommunication technologies are multifunctional and universal, but by themselves they do not make any changes in the learning process. Therefore, it is all the more relevant it is not so much the active implementation of innovative technologies in the learning process, but their correct selection and purpose of use in the educational process. Accordingly, the term "educational technologies" is closely related to new information technologies, and modern education is impossible without their use. The use of innovative technologies to activate the educational process also led to a change in the structure of its organization, which led to the introduction of modular training into university practice, which led to changes in the system of professional training of specialists (development of new programs, standards, tests, etc.).
Currently, technologies that allow organizing the educational process taking into account the professional orientation of education, as well as focusing on the personality of the student, his interests, inclinations and abilities, are productive. One of the most important problems - didactic - the problem of teaching methods - remains relevant both theoretically and practically. The educational process, the activity of the teacher and students, and therefore the learning outcome, depend on its solution. A method is a way of moving toward truth. At the current stage of the development of our society, the need for non-standard thinking creative individuals has increased more than ever, and especially for the creative activity of a specialist and developed technical thinking, the ability to design, evaluate, and rationalize equipment and technology. Solving these problems largely depends on the content and technology of training future specialists. The success of learning depends mainly on the orientation and internal activity of students, the nature of their activities, the degree of independence, the manifestation of creative abilities, and this should serve as an important criterion for choosing a method. It should be remembered that the state of transition from the industrial age to the information age is gaining momentum, which means that an increasing number of people are faced with the need to process an ever-increasing volume of information. Today, in higher education institutions, special attention should be paid to the updating of educational literature, its reorientation to methodological issues and the formation of students' competencies in the field of independent work with information. The educational and methodical resources created will certainly be oriented towards supporting the independent work of students. Their cognitive motivation is intensified thanks to the block-modular construction of educational courses, the equipping of educational and methodical complexes with diagnostic materials, the creation of electronic textbooks and training aids. The development of the Internet culture of teachers and students is becoming important as one of the most important tasks of innovation in the educational space, as it ensures the orientation of the educational process to the prompt use of the latest achievements in science and pedagogical practice. Returning to the problems and tasks of domestic pedagogy, we will try to outline the basic, currently main aspects of research.

Traditional approaches to education include ways, methods, and techniques primarily focused on reproductive learning, that is, on learning and using ready-made samples, standards of concepts and actions. Then it is advisable to consider two directions in education:

1. "Modernization of traditional education in the spirit of effective organization of assimilation of given samples, achievement of clearly defined standards. Within this direction, the renewal of the educational process is focused on the traditional didactic tasks of reproductive education, the presentation of education as a "technological" pipeline process with clearly fixed, detailed expected results."

2. An innovative approach to the educational process, in which the goal of education is the development of students' "opportunities to master new experience
based on the purposeful formation of creative and critical thinking, experience and tools of educational and research activities, role-playing and simulation modeling."

It is appropriate to ask an important question: why do we need innovative approaches, models, and technologies today? Among a considerable number of specialists in the field of education, there is an opinion that the use of computers and telecommunications, new technical means in the educational process is the only thing necessary for the modernization of education. The difficulty of introducing an innovative process into the practice of education is that, for example, distance courses based on new learning technologies do not always "fit" into the traditional structure of educational programs. When combining traditional and innovative courses, their developers have to adjust existing programs, conduct additional training of professors and teachers. Returning to the question of the role of the technological subsystem in the modernization of education, based on the analysis of the development of education not only in our country, but also in other countries of the world, it is possible to draw a definite conclusion: the use of new information technologies only leads to the solution of acute problems of modern education when the development of the technological subsystem of education is accompanied by radical changes in all other subsystems: pedagogical, organizational, economic - and even significantly affects the theoretical and methodological foundations of the educational system. That is, the development of new information technologies entails the formation of a fundamentally new educational system that can ensure the provision of educational services to millions of people while reducing the specific costs of education. Internet education, which can be defined as the education of the general population, obtained with the help of information and educational resources of the Internet, is aimed at achieving these goals. In modern education, a significant place is given to the use of new information technologies, Internet technologies. It is known that information technology is developing several times faster than any other technology, and the computer is becoming an inexpensive and highly productive work tool. The world community is coming to the widespread use of computers and information networks, including for educational purposes. The development of new information technologies of the fourth generation entails the formation of a fundamentally new educational system that can ensure the provision of educational services to millions of people while reducing the specific costs of education. Internet formation, which can be defined as the education of the general population, obtained with the help of information and educational resources of the Internet, is aimed at achieving these goals. The idea of developing new learning technologies based on widespread computerization and informatization of pedagogical systems was determined by such world trends as: development of global production infrastructure; informatization and automation of all branches of science, technology and technology; a change in the professional structure of society and a person's outlook on work; informational integration of education into the global system.
Conclusions. So, at the same time, it should be noted that three groups of subjects are formed in the individual educational program: mandatory for study at a fixed time; mandatory for study in terms determined by the student; elective courses. The construction of an individual learning trajectory takes place in the interaction of a student and a tutor, who diagnoses the student's primary cognitive interest, creates conditions for its deepening in the process of carrying out educational research or projects, and provides tutor counseling in the field of professional educational programs. Blended learning is being developed, involving interaction with the tutor via e-mail, discussions in forums, face-to-face meetings, and self-study. The advantages of blended learning consist in increasing the motivation of students to study (they have the opportunity to choose the most relevant course modules for them that meet their needs, receive immediate feedback from teachers, can immediately apply the acquired knowledge in practice); in the ability to control the results of students' studies and the amount of knowledge they have acquired (the knowledge assessment system inside the remote access site, as well as active interaction with the teacher at face-to-face meetings allows you to track the correctness and quality of learning the proposed material, as well as timely support and adjust the individual learning trajectory of students). Blended learning combines the effectiveness of distance learning and the effectiveness of individual interaction between students and teachers. Among teaching technologies, the most interesting for distance learning are those technologies that are focused on group work of students, cooperative learning, active cognitive process, work with various sources of information. It is these technologies that provide for the wide use of research, problem-solving methods, the application of acquired knowledge in joint or individual activities, the development of not only independent critical thinking, but also the culture of communication, the ability to perform various social roles in joint activities. Promising Internet technologies in education and scientific activities are Internet conferences, chats, teleconferences and video conferences. For example, the organization of electronic conferences, in particular, on university websites. It is obvious that the website of the university is the main form of its activity on the Internet. Its purpose is not only to satisfy the informational needs of those interested in the activities of this institution or the problems of its scientific research, but also in the organization of joint research within the framework of virtual Internet communities of scientists from other institutions of the world.

Therefore, the introduction of innovative teaching technologies is now the need of the hour. The training of a technical specialist using the latest achievements of science and technology is the goal of current higher professional education. In addition to all the positive factors and innovations brought by information technologies, one cannot fail to note their negative consequences. Students began to turn to printed publications less, to read less, and therefore to think, draw independent conclusions, make decisions. This is one of the sides of the question about the expediency of using a computer in education. The second aspect of the
advantages and disadvantages of the use of computer technologies lies in the significant individualization of the educational process. Obviously, computerization and, in particular, the use of computer textbooks "closer" the student to the material being studied, allows him to rely more on his own abilities in the speed of material perception, the number of necessary repetitions of this or that section, and the total time spent to learn the whole subject. But this same individualization deprives the student of the element of excitement in the process of learning, this powerful incentive to acquire new knowledge. The introduction of information technologies into the educational process should be qualitatively justified and not a universal substitute, but a complementary factor in the system of modern education.

References:
https://doi.org/10.31652/2412-1142-2023-69-134-141 [in Ukrainian].
https://doi.org/10.31652/2412-1142-2023-67-44-51 [in Ukrainian].
https://drive.google.com/file/d/14uIUdsoOGc072FB1iwPZBZ_EoNE-ZI9v/view [in Ukrainian].


Література:


