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INFORMATION AND COMMUNICATION TECHNOLOGIES AS A GUARANTEE OF IMPROVING THE QUALITY OF TRAINING OF A FUTURE SPECIALIST

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Information and Communication Technologies as a Guarantee of Improving the Quality of Training of a Future Specialist

This article focuses on the special importance of informatization of education, as the main aspect of the existence and development of modern higher education. The process of computerization of education is considered as the main basis of its informatization in the historical aspect. The importance of the introduction of information and communication technologies in the educational process and the interest of scientists in this field of education were emphasized. The analysis of the interest of modern scientists in the consideration of such issues as the use of information and communication technologies in education has been carried out; informatization of education and its purpose; didactic and psychological aspects of the use of information and communication technologies in the educational process; problems associated with the widespread introduction of information and communication technologies in higher education institutions and the informatization of education in general. Attention is focused on the importance of acquired skills and abilities obtained as a result of informatization of education and the introduction of information and communication technologies into the educational process. The goals of informatization of education of a modern institution of higher education are defined. The types of training directly related to information and communication technologies are considered. The article states that the practice of introducing information and communication technologies into the educational process of higher education institutions is spreading every day and has only positive results. The relevance of this study is underlined. It is noted that the learning process based on the use of information and communication technology is the basis for changes in the structure of the educational process for both teachers and students.

Key words: informatization of education, modern institution of higher education, computerization of education, information and communication technologies, goals of informatization of education.

At present, informatization of education is the main factor in the existence and development of a modern high school, since its main goal is the disclosure and expansion of the individual potential of each individual. Informatization of education is a set of interrelated organizational and legal, socio-economic, educational, methodological, scientific and technical, production and management processes aimed at satisfying informational, computing and telecommunication needs (other needs related to the introduction of methods and means information and communication technologies – ICT) of the participants of the educational process, as well as those who manage and provide this process (including carrying out its scientific and methodological support and development) [1]. Informatization of education contributes to increasing the efficiency and intensification of the educational process through the use of information technology and the introduction of new methodological developments in the learning process [2, p. 34]. Informatization of education envisages and catalyzes the general processes of development of society and education. Essential specific features acquire the basic components of systems of education, upbringing and education: the content of education, methods, means and technologies of education and training, organization of education and training systems [1]. ICT is a modern means of improving the quality of learning quality through teaching any discipline in higher education institutions and during pre-school training.

Considering the goals of informatization of the educational process of higher education, we identified a number of problems associated with legal, economic, educational, methodological, and scientific and technological processes. The introduction and application of information and communication technologies in the training of future professionals plays an important role not only as a tool for the disclosure and development of individual abilities of the individual, but also as a catalyst for comprehensive informatization of society. Information and communication technologies in education are part of pedagogical technologies aimed at improving the quality of education, based on the formation of knowledge and the

acquisition of acquired skills and abilities that, under the slightest effort, can be adapted to the individual characteristics of everyone who wants to study.

According to V. Velichko, the use of information technologies in educational activities will enable future specialists to use a wide range of modern methodological approaches and technologies, help to reveal their inner creative potential, become a „visual guide“ to the skills and abilities of using information technology to achieve higher learning outcomes [2, p. 75].

Many works devoted to the consideration of problems of informatization of education and the purposes of informatization of education. The most profound ones include V. Bykov, A. Gurzhii, M. Zhaldak, Yu. Zhuk, M. Zgurovsky, M. Lapchik, N. Morze, S. Rakov, Yu.Tryus and others. The theoretical aspects of the application of information and communication technologies in education are reflected in the writings of such researchers as V. Velychko, L. Gavrilova, R. Gurevich, M. Zhaldak, M. Kademiya, V. Lapinsky, A. Manako, Y. Mashbitsa, N. Morze, L. Petukhova, S. Semerikov, O. Spivakovsky, O. Spirin, N. Talizina, A. Tikhomirova and others.

The problems associated with the widespread introduction of ICTs in higher education institutions and informatization of education are considered in the works of V. Bespalko, V. Bykov, V. Velychko, M. Zhaldak, M. Zgurovsky, A. Kalensky, Yu. Mashbits, L. Panchenko, O. Spivakovsky, V. Sholokhovich and many others. However, the issue of improving the quality of future teachers' training with the help of information and communication technologies is not fully addressed.

Today's education requires the diversification of the forms, methods and technique of organizing educational activities. Advantage should be given to the forms, methods and techniques that provide for the use of information technology in their arsenal, which can individualize the learning process, enrich the acquired knowledge, become effective assistants in professional activities [2, p. 74]. Implementation of the latest information and communication technologies in the educational process will enable to accelerate the realization of such an objective as informatization of education. Currently, it is possible to borrow the features of this process from the experience of other countries such as the United States, South

Korea, England, Finland, Estonia, Ireland, Bulgaria, Germany, Switzerland and others. Such experience gives modern scholars a clear understanding of the integrity of building a system of informatization of education through the introduction of information and communication technologies in the educational process of institutions of higher education.

Informatization of education is directed not only at the formation of a medium of knowledge, but above all on a person who can apply acquired knowledge and skills, work with information resources for successful activity in any sphere of public life, in fact - for the innovative development of society [1]. Note that the level of innovation development of society depends directly on the level of informatization of education, since informatization of society is a process of education and formation of each individual individual of a new generation for a full-fledged existence in conditions of qualitative improvement of modern information and technical structures and processes created for the satisfaction of needs and the realization of life existing rights of a modern citizen.

The basic element of the process of informatization of education is the process of computerization of education, which began at the beginning of the XX century. In general, the process of computerization of education of scientists and researchers (V. Bykov, V. Velychko, O. Voronkin, M. Zgurovsky, N. Morze, S. Semerikov and others) are divided into three stages, but the initial date varies from the 20s XX century to the 50's of XX century. So, for example, S. Semerikov, determined the beginning of the first stage exactly the 20-ies of XX century. According to him, the first stage (20-50th years of the twentieth century) is characterized as a period of application of mechanical, electromechanical and electronic individualized devices, with which the teaching material was provided and the control and self-control of knowledge – the technology of programmed training – was performed. The second stage (50–80s of the twentieth century) is characterized by the wide introduction of computers into practical training activities. And the third stage (from the 80 years of the last century) is characterized as a stage of personal computers and computer networks [4].

It is important that the entire initial stage of the development of informatization, which includes the development of electronic computers and software related to universities, because the development of computer technology needed highly skilled professionals who were trained directly in those universities where the first electron-computers were built [2, p. 62]. Informatization of education is unquestionably connected with the development of material, technical bases and training complexes of educational methods for their use. An important factor in the delay of the development of informatization of education, as well as the informatization of society as a whole, is the lack of sufficient financing of these projects by the state. That is why the groups of programmer initiators, which independently organized, so-called „clubs of interests", began to form themselves, in which they created software for free distribution. Thanks to such software products, faculty members have more and more opportunities to use electronic computers in the learning process, which gradually led to the widespread use of information and communication technologies in educational activities and, as a result, led to the informatization of education. The first software products used in university education belonged to free software, however, such a formulation as „free software" was not yet used, as there was no global software commercialization. Also, it should be noted that such software was rather narrow orientation and was used purely for mathematical calculations.

Teachers of mathematical disciplines mastering software products of the indicated orientation and using this knowledge and their own developed techniques during training of students of mathematical specialties became the first example of introduction and application of information technologies in university education. These actions have shown that such implementation significantly facilitates the availability of teaching materials and raises interest for students. The experience of using software products of mathematical focus while working with students was invaluable and fundamental to the teachers of other disciplines. Understanding the benefits and need of teaching staff in such educational products, programmers

actively create and recycle existing computer programs that effectively begin to be used during lectures and laboratory and practical classes.

Further evolution of informatization of education, which took steps from equipping educational institutions with electronic computers of the first generation to the use of the most advanced means of ICT, reflects both the achievements of scientific and technological progress and the achievements in the appropriate training of teaching and educational personnel, the level of computer-oriented scientific-methodical provision of the educational process, automated systems of teaching and education, which caused the widespread introduction of ICT in educational practice [1]. Consequently, information and communication technologies continue to be introduced into the educational activities of higher education institutions and gradually, with the help of graduates of higher education, are applied also in other branches of education such as secondary schools, technical schools, colleges, etc.

Information and communication technologies of teaching are part of modern pedagogical technologies that are used to optimize the construction of the education process and represent a set of programs for organizing the educational process aimed at learning and acquisition of skills and abilities whose specificity is expressed in the emphasis on the development of those who learn not only in that , to perceive and use the knowledge provided, and, first of all, to independently obtain knowledge from a variety of sources of information. These technologies can radically change the function of the teacher in the educational process, as well as the attitude and perception of the educational material by those who study. Information and communication technologies are one of the main factors in implementing a personal approach to each individual. By combining traditional learning technologies and information and communication technology significantly increases the efficiency of the discovery and development of individual abilities of a single person, improving the learning process, increasing the quality of education emerging understanding of the importance of constructing their own educational path and, as a result, made the first attempts to design.

Through the use of ICT in teaching everyone that previously did not have the physical opportunity to afford it the opportunity to learn and acquire knowledge and skills in various categories and areas. For example, people with disabilities which is still based on their physical condition and health, higher education was not achievable dream now thanks to existing technologies and developed techniques have the opportunity not only to gain knowledge but also coveted diplomas.

A large number of software products for educational purposes both free and proprietary has been developed and implemented in different educational fields over the past four decades. Educational and methodical literature was prepared where the need for ICT is emphasized at all levels and in all areas of education. V. Velichko noted that the main directions of the use of information and communication technologies in the educational activity of higher educational institutions are [2, p. 124]:

- an element of the methodology of scientific research;
- an integral part of the education management system;
- the object of studying;
- a learning tool.

Each of them is in close cooperation with others.

There are many types of education directly related to ICT. Types of learning such as: distance learning, e-learning, mobile learning, combined learning, etc., expand opportunities and choice for anyone who wants to study or improve their qualifications or receive additional education. First of all, these possibilities are connected with the emergence of new, virtually unlimited pedagogical opportunities that arose as a result of the introduction of information and communication technologies in education and are successfully used for the individualization and differentiation of the educational process, its flexible adaptation to the individual characteristics of those studying, the use of this process of additional information learning resources, a wide range of pedagogical methods and technological training options, scale expansion and changes in the nature of the era of educational communications, the strengthening of procedural and multimedia characteristics of

the possibilities of learning tools, expanding the scope of innovative pedagogical activities [1].

The practice of ICTs implementing in the educational process of institutions of higher education extends every day. Many software products, techniques and technologies that were used at the beginning of the education informatization were subject to multiple changes and updates, and new ones. Currently, information and communication technologies are rapidly being implemented in the educational process of higher education institutions covering virtually all spectra of electronic social communication. If the first use of ICT in the study concerned software products for purely mathematical calculations and during the teaching of disciplines in the mathematical cycle, then this range is almost limitless. Educational software products are used to teach any discipline, from psychology and jurisprudence to philology, physical education and music. And the wider the range of the use of various software within a discipline, the more benefit it brings to those who learn, as they receive new functionalities that significantly affect the process of learning and is more beneficial in achieving the goals.

Information and communication technologies are innovative pedagogical technologies of the educational system that are used to create new opportunities for transfer of knowledge (the activities of the teacher), perception of knowledge (activities of those who study), assessment of the quality of education and the comprehensive development of personality during the educational process [5] , makes the educational process more intensive and productive at the expense of the use of opportunities of multimedia, social networks, intensifies interpersonal connections, provides search and use of information on wide-ranging sources, creates comfortable conditions for communication in the most acceptable form.

Modern scholars devote much attention to the use of ICT in education and are described in doctoral dissertations. For example, in the doctoral dissertationof M. Lapchik It is noted that even in high school a teacher of computer science with basic knowledge in the field of computer science is needed [6]. The main goal of computer science students' training is the formation of professional informational

competencies based on public order, state standards of higher education and personal choice of the student, the function of fundamentalization of informatics education is the basis for the formation of new qualities of a future specialist [4, p. 68]; the professional orientation function of the fundamentalization of informatics education has the following structural components: target, content, technological and final [7]; multimedia in education – a perspective direction in the field of information processing of human activity, the integration of heterogeneous data of computer systems in order to more fully present the results of intellectual production in science, art, education, industry, etc. [8]; informative awareness – the ability to implement the systemic knowledge, skills and abilities of acquiring and transforming information in various fields of human activity for the qualitative performance of professional functions and conscious prediction of the consequences of their activities [9]; information competence includes the ability to independently search, analyze and select the necessary information, organize, transform, store and transmit it using real objects and information technologies [10]; information competence is the main component of information culture as part of the general culture of personality [11]; informational culture is a set of information outlook, system of value orientations, knowledge, skills, proficiency that provide purposeful and effective independent activity in order to meet their own and professional needs in information products [12]; Informatization of education is one of the most important elements of culture in general, characterizing the material and spiritual development of society, the level of organization of information processes, the degree of satisfaction of people's needs in information communication, timely, reliable and exhaustive information and provides a coherent vision of the world [11]; ICT use in education contains the ability and skills in information and communication pedagogical environment, the ability to use multimedia educational tools to meet the challenges of professional activity, the ability to use knowledge control of a computer, the ability to use electronic means and are ready to design your own multimedia training means, forms the skills of Internet communication [12]. There are many other works devoted to the informatization of education and the use of ICT in education.

Informatization of education is stipulated by branch directions. Considering the goals of informatization of education V. Bykov noted that at the present stage of development of society and education the main goal is to prepare future specialists for active and productive life in the information society, to provide high-quality, affordable and effective education, to create educational conditions for lifelong learning at the expense of wide introduction into the educational practice of methods and means of ICT and computer-based technologies [1]. Informatization of education ensures achievement of two strategic goals. The first of these is to increase the efficiency of all types of educational activities through the use of information and communication technologies. The other is to improve the quality of the training of specialists with a new type of thinking that meets the requirements of the information society [14].

Under current legislation, namely the Law of Ukraine on the National Informatization Program from 04.02.1998 . In the current edition of 12.25.2015. By informatization means a series of interrelated organizational, legal, political, socio-economic, scientific-technical, industrial processes aimed at creating conditions for meeting the information needs of citizens and society through the creation, development and use of information systems, networks, resources and information technologies built on the basis of the application of modern computing and communication technology [15].

Each teacher working as well as future needs to know that the informatization of education - a modern way to resolve issues of interest to both teachers and future professionals and possess the skills to use information resources is primarily by raising their own professional capacity. And this is also one of the goals of informatization of education.

The primary goals of informatization of education are the following components:

- formation of skills of self-education and self-realization;
- disclosure of the internal potential of each person and its development;

– development of the educational spectrum of services for people with special needs;

– increase in the quality of education;

– formation of skills of constructing own educational trajectory;

– raising the level of fundamentalism of general and vocational education [1];

– creation of new special methods, tools and educational technologies [1];

– raising the level of pre-professional training of high school students in a secondary school [1];

– to expand the ability to diagnose the knowledge, skills and abilities of those who are studying;

– expansion of methods and means of study using modern scientific and technical developments;

– creation of favorable conditions for those wishing to increase their own qualifications;

– development of postgraduate education and adult education [1];

– distribution of limits and possibilities of self-realization;

– formation of the informatized society with the informatively experienced population [2];

– development of the intellectual potential of the nation;

– Improvement and modernization of traditional forms of training organization.

The degree of informatization of education is a direct reflection of the degree of informatization of society, that is why the information development of education becomes the main factor in the growth of the general level of training of future specialists, the development of skills to create and implement the latest technologies in future professional activities, forms the theoretical knowledge base while studying at a pedagogical institution of higher education.

Based on the above mentioned and based on the fact that the computerization of education is the main factor in the existence and development of modern high school and society as a whole, we can state that the informatization of education of all levels should become one of the main and important tasks of the state. As already noted, informatization of education is the basis of the informatization of society as a whole, which is why the problems of informatization of objects of education should be given the highest priority at both the local and state levels. Computerization of education directly influences the content of education and methods of its organization, has pedagogical goals and objectives. Provides the necessary conditions for the integration of the educational system of Ukraine into the world information space. Educational activity based on the use of information and communication technologies forms the basis of changes in the structure of the working process of teachers and forms a new perception of the educational material by those who learn, affects the development of self-education through the use of information learning resources, thereby gaining experience of using ICT both in everyday life and future professional activities. The widespread introduction and application of ICT in the educational sector is becoming a pillar of the development of scientific research and development. The quality of educational software products are improving. There is a continuous development of ICT-based pedagogical technologies. New educational courses and methods are being developed and implemented in educational areas, as well as various forms and technologies of training. Taking into account the attention paid by scientists and researchers to informational education, the introduction of information and communication technologies in the educational process at all levels and in all branches of education, we have the opportunity to conclude that informatization of education is a constant process that carries the development of society, improvement of quality of life and education, the growth of forms and methods of teaching.

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Федоренко О. Г., Рожков С. І.

Інформаційно-комунікаційні технології як запорука підвищення якості підготовки майбутнього фахівця

У даній статті акцентовано увагу на особливому значенні інформатизації освіти, як головному аспекті існування та розвитку сучасної вищої школи. Розглянуто процес комп'ютеризації освіти, як головний базис її інформатизації в історичному аспекті. Підкреслено важливість впровадження інформаційно-комунікаційних технологій у навчальний процес та зацікавленість науковців у даній галузі освіти. Проведено аналіз зацікавленості сучасних науковців у розгляді таких питань як застосування інформаційно-комунікаційних технологій у навчанні; інформатизація освіти та її цілі; дидактичні й психологічні аспекти застосування інформаційно-комунікаційних технологій у навчальному процесі; проблеми, пов'язані з широким впровадженням інформаційно-комунікаційних технологій у вищі навчальні заклади та інформатизації освіти в цілому. Акцентовано увагу на важливості набутих умінь і навичок, які були отримані в результаті інформатизації освіти і впровадження в навчальний процес інформаційно-комунікаційних технологій. Визначено цілі інформатизації освіти сучасного закладу вищої освіти. Розглянуто види навчання, що безпосередньо пов'язані з інформаційно-комунікаційними технологіями. В статті зазначено, що практика впровадження інформаційно-комунікаційних технологій в навчальний процес закладів вищої освіти поширюється з кожним днем і має лише позитивні результати. Підкреслено актуальність даного дослідження. Зауважується, що навчальна діяльність заснована на використанні засобів інформаційно-комунікаційних технологій є базисом змін будови навчального процесу як для викладачів, так і для студентів.

Ключові слова: інформатизація освіти, сучасний заклад вищої освіти, комп'ютеризація освіти, інформаційно-комунікаційні технології, цілі інформатизації освіти.

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Інформаційно-коммуникационные технологии как залог повышения качества подготовки будущего специалиста.

В данной статье акцентировано внимание на особом значении информатизации образования, как главном аспекте существования и развития современной высшей школы. Рассмотрен процесс компьютеризации образования, как главный базис ее информатизации в историческом аспекте. Подчеркнута важность внедрения информационно-коммуникационных технологий в учебный процесс и заинтересованность ученых в данной области образования. Проведен анализ заинтересованности современных ученых в рассмотрении таких вопросов, как применение информационно-коммуникационных технологий в обучении; информатизация образования и ее цели; дидактические и психологические аспекты применения информационно-коммуникационных технологий в учебном процессе; проблемы, связанные с широким внедрением информационно-коммуникационных технологий в высшие учебные заведения и информатизации образования в целом. Акцентировано внимание на важности приобретенных умений и навыков, полученных в результате информатизации образования и внедрения в учебный процесс информационно-коммуникационных технологий. Определены цели информатизации образования современного учреждения высшего образования. Рассмотрены виды обучения, непосредственно связанные с информационно-коммуникационными технологиями. В статье указано, что практика внедрения информационно-коммуникационных технологий в учебный процесс учреждений высших образования распространяется с каждым днем и имеет только положительные результаты. Подчеркнута актуальность данного исследования. Отмечается, что процесс обучения основанный на использовании средств информационно-коммуникационных технологий является базисом изменений строения учебного процесса как для преподавателей, так и для студентов.

Ключевые слова: информатизация образования, современное учреждение высшего образования, компьютеризация образования, информационно-коммуникационные технологии, цели информатизации образования.

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