



# European Vector of Modern Education, Science and Production – 2023

**Series of monographs  
Slovak publishing house  
NES Nová Dubnica s.r.o.**

**Monograph 1**

Publishing House NES  
Nová Dubnica s.r.o., 2023



# **European Vector of Modern Education, Science and Production – 2023**

**Series of monographs  
Slovak publishing house  
NES Nová Dubnica s.r.o.  
Monograph 1**

**Publishing House NES Nová Dubnica s.r.o., 2023**

**Editorial board :**

Róbert Hulák – PhD, NES s.r.o., Slovenská Republika

Jiří Kabelka – PhD, DEL a.s., Czech Republic

Jitka Belková – Master of Engineering and Technology, Slovenská Republika

Zdeněk Navrátil – Master of Mechanical Engineering, Czech Republic

**Reviewers :**

Filip Gabriš – PhD, NES s.r.o., Slovenská republika

Jana Hudecová – Master of Engineering and Technology, Slovenská republika

Zdeněk Králíček – PhD, DEL a.s., Czech Republic

Series of monographs Slovak publishing house NES Nová Dubnica s.r.o.,  
Slovenská Republika

**Monograph 1**

The authors bear full responsible for the text, quotations and illustrations

Copyright by NES Nová Dubnica s.r.o., Slovenská Republika, 2022

**ISBN 988 – 963 – 8454 – 15 – 3 – 3S**

**Editorial compilation**

Publishing House NES Nová Dubnica s.r.o.

M.Gorkého 820/27, P.O.BOX

018 51 Nová Dubnica, Slovenská republika

tel. +421-42-4401 209

## TABLE OF CONTENTS

<b>CHAPTER 1. MODERN BASICS OF ECONOMICS, MANAGEMENT AND TOURISM</b> .....	5
1.1. The Place and Role of Corporate Analytics in the Structure of the Enterprise Management System .....	5
1.2. Ways of Improving the Organization of Managerial Activity at the Customs Subdivision of the Enterprise .....	14
1.3. Current Problems of Warehouse Logistics in Ukraine .....	21
<b>CHAPTER 2. INNOVATIVE AND MODERN FOUNDATIONS OF PEDAGOGY AND PSYCHOLOGY</b> .....	30
2.1. Anxious-Depressive Emotional States as a Factor of Personality' Media Religiosity in the COVID Pandemic .....	30
2.2. Innovative Approach in Teaching Structure .....	39
<b>CHAPTER 3. MODERN TRENDS IN THE DEVELOPMENT OF LINGUISTICS AND PHILOLOGY</b> .....	49
3.1. Development of Thinking and Foreign Speaking Competence During Students Learning Special Terminology in Latin and Foreign Languages .	49
<b>CHAPTER 4. PSYCHOLOGICAL AND PEDAGOGICAL FOUNDATIONS OF THE APPLICATION OF MODERN INFORMATION TECHNOLOGIES IN THE EDUCATIONAL PROCESS OF FUTURE SPECIALISTS IN THE ENERGY INDUSTRY</b> .....	57
4.1. The Problem of Informatization of Education Today .....	57
4.2. Psychological and Pedagogical Problems of Using Modern Information Technologies in the Educational Process of Future Specialists in the Energy Industry .....	63
4.3. The Role and Place of Modern Information Technologies in the Individualized Training of Future Specialists in the Energy Industry .....	65
4.4. Methodical Aspects of the Application of Modern Information Technologies in the Educational Process of Future Specialists in the Energy Industry .....	67
<b>CHAPTER 5. ANALYTICAL REVIEW OF ANTIBIOTIC USE PROBLEMS AND ANTIBIOTIC RESISTANCE</b> .....	74
5.1. Analytical Review of Antibiotic use Problems and Antibiotic Resistance, Part 1 .....	74
5.2. Analytical Review of Antibiotic use Problems and Antibiotic Resistance, Part 2 .....	90
<b>ANNOTATION</b> .....	110
<b>ABOUT THE AUTHORS</b> .....	113

## CHAPTER 4. PSYCHOLOGICAL AND PEDAGOGICAL FOUNDATIONS OF THE APPLICATION OF MODERN INFORMATION TECHNOLOGIES IN THE EDUCATIONAL PROCESS OF FUTURE SPECIALISTS IN THE ENERGY INDUSTRY

### 4.1. The Problem of Informatization of Education Today

At the beginning of the 21st century, deep transformations are taking place in all spheres of public life. Globalization of the economy, the use of modern information technologies in production and communications fundamentally changed the development of social needs and the conditions for their satisfaction. The modern stage of the development of information civilization demands from each country the appropriate restructuring of the system of using the latest achievements of information technologies. One of the important components of this restructuring is the training of personnel with the skills and abilities to search, process and analyze educational information. Personnel training should begin in institutions of general secondary education and continue in institutions of higher education, as stipulated by the law of Ukraine [4].

The main direction of improving the educational process of any energy discipline in the future is the use of modern information technologies. Modern information technologies are based on modern hardware and software tools, information technologies, distributed data processing in networks, on the use of economic and mathematical methods and models, decision support systems and expert systems.

For the first time in human history, generations of things and ideas change faster than generations of people. This creates complex problems in the life of a person who has to change his professional orientation several times during his life. It also creates a number of psychological problems related to a person's age and capabilities.

It follows that one of the important problems in the future of humanity is the problem of finding the appropriate organizational structure of the education system and new principles of education, which would become one of the main factors of human development. At the same time, there should be a transition from the principle of "education for life" to the principle of "education throughout life".

The improvement of methods and means of modern information technologies create real conditions for their use in the education system for the purpose of developing a person's creative abilities at every step of his life. But the use of modern information technologies in the educational process of future specialists in the energy industry creates its own psychological and pedagogical problems.

With modern information technologies, today we connect the real possibilities of building an open system of education, in which every person can choose his own learning trajectory. The use of modern information technologies contributes to the individualization of the educational process due to programming and adaptation of educational programs. The individualization of the educational process is also helped by the use of formalized methods of pedagogy and psychology.

The Internet and telecommunication technologies based on global networks and intelligent computer systems open completely new opportunities for the educational process. The combination of such systems and networks forms the basis of a new information civilization that creates and shapes its own worldview. The creators of this world already have a different way of thinking, new ethics and a culture of mutual understanding. The formation of the information society, the creation of which was announced by the Japanese in 1981, confronts us for the first time with the phenomenon of biological and psychological changes in the human personality. This world opens a new dimension of consciousness, binds it into a single whole and creates an ordered system of a new culture.

The use of modern information technologies will create fundamentally new opportunities for improving a person's sensitivity of perception. A new direction of screen art of modern information technologies is being created and rapidly spreading, which gives any person with a computer access to the masterpieces of world culture. The computer has found the ability to work with many "real" objects and programs according to the laws of the real world [1].

No one doubts the necessity of using computer technology in education, but not everyone thinks about the fact that the use of modern information technologies not only improves the educational process, but also forms a special human perception of the environment, in which objects of physical reality are present alongside with representations about them in human consciousness and in the system of representations in the information space. At the same time, the interaction between psychic and cybernetic spaces is realized in human consciousness, which is interesting and mysterious, which requires specific research.

Today, views, tastes and attitudes towards the events taking place are formed in the younger generation mainly under the influence of mass media, communication and the latest information technologies, which causes the need to update the issue of informatization of education. Not only educators, but also psychologists and philosophers pay close attention to this important problem. Informatization, first of all, involves the use of modern information technologies in the educational process of future specialists in the energy industry.

Informatization of education should contribute to comprehensive and harmonious development of each student's personality, and above all, which is currently a major problem of informatization of education, activation and increase of creative abilities.

It is undeniable that the process of informatization of education has acquired an irreversible character. Significant tasks for its intensification were set in the report of the Minister of Education and Science of Ukraine V. Kremen at the II All-Ukrainian Congress of Education Workers "National Doctrine of Education Development of Ukraine in the 21st Century".

At the same time, there are a number of warnings in the pedagogical press about each of the levels of education. The possible negative consequences of using modern information technologies can be divided into two main groups:

- a) deterioration of students' physical health;



b) appearance of psychopathological symptoms.

There is no doubt that the causes of the mentioned negativisms deserve comprehensive analysis and serious primitive work.

Placing the scales "for" and "against" in the raised issue, many arguments "against" are associated with harmful effects on people's health.

V. Bondarovska, president of the computer ecology association, names the following main risk factors for the user's physical and mental health: computer radiation; image quality on the screen; decoration and lighting of the premises; the amount of time the user spends on the computer; ergonomic and psychological quality of programs; stresses arising in connection with the specifics of computer use.

According to the head of the childhood hygiene laboratory of the Ukrainian scientific and hygienic center of the Ministry of Health of Ukraine, P. Poles, all hygienic requirements and regulations (standards) for the organization of the educational process with the use of computer equipment are similar, except for the regulations for continuous work behind a personal computer screen and special attention and strict requirements for the furniture provision of computer equipment offices "in accordance with will grow...".

The socio-philosophical aspect of computerization was considered by scientists Y. Abakov, G. Smirnova, V. Venda, K. Zuev, V. Vynokurov, A. Rakitov, T. Andrianova, A. Samarskyi, G. Smolyan and others. No less importance is attached to the humanitarian aspect of computerization in the works of scientists: A. Glynn, D. Ravych, V. Zinchenko, Yu. Sachkov, M. Novik, D. Pospyelov.

We can agree with V. Zinchenko's opinion that computer technology, which has entered all spheres of human life, creates new forms of human activity, both for an individual and for our society as a whole. It is this factor that largely affects human psychology (to his cognitive, operational and technical spheres, to motivation, to abilities, etc.). Of course, if such an influence on the human psyche is not taken into account when using modern information technologies in the educational process, the development of software products, then this can have a negative impact on the development of the individual. In this case, one can agree with the opinion: "...informatics tools radically change the subject of human activity. It seems to lose its ontology and becomes "epistemological". This is an activity not with objects, but with various forms of their, model, symbolic, symbolic representation. In such a situation, it is possible to lose not only the everyday, objective character of the activity, but also the distortion of its essence, which is accelerated in being" [1].

Some psychologists note that in our century of technology and modern information technologies, we should talk not only about social, but also topical topics of psychological consequences of informatization (O. Tikhomirov, N. Talizina, L. Fedorov). The well-known psychologist O. Tikhomirov singles out the following psychological problems of computer use that must be taken into account: "1) the influence of informatics, computer technology, automation tools on the human psyche; 2) their impact on psychological science, which studies the laws of mental life; 3) the use

of scientific psychological knowledge in works on informatics and computer technology" [3].

The scientist defines informatization and the purpose of its implementation as a requirement of time. The use of technology is caused by social needs. But all the more important is the provision of priority directions that contribute to the positive development of society. And, certainly, with the help of psychological science, you can achieve a better result. Because even with the informatization of education, first of all, we are talking about the person and the society in which he is located, and these are the priority areas of psychology. It should be added that modern information technologies provide fundamentally new opportunities for organizing, organizing and presenting educational material, which significantly affects pedagogical practice. These new opportunities are due to the appearance of graphic editors, ecological screens with high image clarity and changes in the architecture of computers, online platforms for distance education.

Currently, there is a breakthrough in the informatization of various types of activities, caused by the development of multimedia technologies. Graphics, animation, photo, video, sound, text in interactive mode create an integrated information environment in which the user acquires new opportunities. At the same time, almost all human sensory channels are used.

Psychologist M. Kalashnikov defines the following psychological problems of informatization of education: "1. Research and assessment of the psychological effects of informatization of education and substantiated recommendations for the use of the computer as a means of learning and development. 2. Solving psychological issues in the creation of software for computers with wide use of the laws of assimilation of various educational material in a certain age period. 3. Creation of psychodiagnostics programs and their use for various didactic and professional counseling purposes" [3].

The outstanding psychologist B. Lomov notes that the computer is such a means, a tool of human activity, the use of which will qualitatively change the possibilities of cognition, increase the possibilities of accumulation and application of knowledge by every person. O. Tikhomirov believes that the use of a computer causes the appearance of new forms of thinking, anemic, creative activity, which can be considered as the historical development of human mental processes [4].

The use of modern information technologies contributes to the formation of such qualities as experimentation, flexibility, structure. They create opportunities for a new, non-traditional perception of obvious facts, establishing original connections between new and old information (the old is perceived with a new vision).

When considering the computer as a means of education, it is necessary to consider the use of this tool from the point of view of psychological science and at the same time evaluate its impact on a person. Psychologists N. Sadovska, L. Zemtsova, and A. Lukankin paid attention to this issue [1].

It is possible to single out three approaches developed in psychology to the problem of "modern information technologies – intellectual activity of a person". From this follows the conclusion made by some psychologists that the computer program is a



theory of human thinking, because with the help of the machine it became possible to solve those tasks that were previously only possible for humans. And the factor of influence of the computer on mental activity naturally arose, taking into account that it can be concluded that the computer changes the individual in all spheres of his mental work. This is the "replacement theory". But this does not take into account a very important factor about "the reality of the relationship between human thinking and computer work" and how the computer affects human thinking. That is why another theory arose – the "theory of addition". Its essence is that the computer acts as a human assistant to some extent and complements its capabilities with purely technical priorities (memory capacity, speed, etc.). But back in the late 1970s, O. Tikhomirov formulated the theory of transformation, with which the scientist proves that "there is not a loss of thinking, but a transformation of the mental activity of a person, the emergence of new forms of mediation, in which the computer as a weapon of mental activity changes this activity" [1]. It is this concept that is recognized as the "methodological basis" for studying all the features of thinking in the interaction of users and modern information technologies.

Psychologists A. Raev and P. Halperin were engaged in the study of the most important aspect of informatization of education – the creation of psychological foundations of programming. N. Talizina and others. For the first time, N. Talizina and G. Gabai expressed the opinion that it is necessary to use electronic computing equipment in the learning process only in those cases when it contributes to its effectiveness. At the same time, the main function is assigned to the computer as a teacher's assistant in the organization of students' educational activities [3].

V. Glushkov, as is known, was engaged in researching the use and impact of computers in various fields of human activity: medicine, economics of automation of learning and organizational management, design and construction works, etc. The scientist advocated studying according to the so-called "programmed textbook" and its computer updating – the use of modern information technologies.

The researches of B. Gershunskyi, A. Yershov, Yu. Mashbyts, and V. Monakhov played a major role in the formation of informatization of education in higher education institutions. B. Gershunsky names three main factors of the need to accelerate the pace of informatization of education: "1) based on the objective necessity of significantly expanding the scale of improving the quality of professional training of highly qualified specialists... 2) ...related to the need to solve the tasks of mass information literacy... formation of specific qualities of the user... with the internal needs of the education system", that is, the use of modern information technologies in the field of education and pedagogical science. The scientist names four directions in which the computer can be used in the educational process:

- computer technology and informatics as objects of study;
- the computer as a means of educational activity;
- the computer as a component of the pedagogical management system;
- the computer as a means of increasing the effectiveness of scientific and pedagogical research [1].

A. Petrovsky cites some fields of application of modern information technologies in the educational process: "1) modeling of various processes and phenomena; 2) automatic design of devices and systems; 3) information and reference service; 4) automation of training; 5) calculations, processing of the results of measurements and experimental studies" [3].

Recently, the significant use of modern information technologies is associated with the problem of developing software products that could be used by people with different levels of technical proficiency. The factor of benefit and admissibility of use is determined by how fully the psychological and pedagogical requirements for the developed tools are taken into account. Therefore, it is necessary to take into account the role of computer language when using these technologies. It should be noted that it is the computer language that is the means of activity, and not the machine itself. It is natural that this strongly affects a person's thinking, can complicate or simplify the work process. Therefore, the choice of programming language must necessarily be adequate for one or another application. O. Tikhomirov and N. Poviakel investigated this problem and determined that one of the important tasks in the psychology of ensuring the informatization of education in institutions of higher education is precisely the problem of computer language when interacting with a computer [1].

I would like to add that when choosing a computer language for the educational process, it is necessary to take into account the individual talent and level of intellectual development (languages are of different complexity) of students. In our opinion, this issue should be solved creatively so that the student has a choice and the opportunity to work with several languages. With this approach, there is an opportunity to reveal the students' potential, which will have a more effective and positive effect on their assimilation of educational material. In addition, the student himself will be able to evaluate all the advantages and disadvantages of one or another computer language.

The problems of psychological aspects of software tools have not yet been sufficiently investigated, many open questions remain. R. Anderson, L. Gorskyi, J. Grimm, V. Koropiv, D. Koryagin, N. Talizina and many other scientists were engaged in researching the problems of creating packages of applied educational programs. Issues of computer architecture, operating system, data structure and algorithms, programming languages, machine graphics, artificial intelligence were investigated by foreign scientists Ronald D. Levkin, Amar Grupt, Peter J. Denning, Robert L. Brown, Niklas Wirth, Lawrence G. Tesler etc. [1].

An important place in the educational process of future specialists in the energy industry is occupied by computer modeling, including environmental models, objects, phenomena. These questions were investigated by I. Kuzmin, M. Valdman, Yu. Panov, and others. [1].

In our opinion, computer modeling programs provide a unique opportunity to study complex processes and phenomena, to predict the final results of these studies. Experimenting with the model, students learn a lot about the properties and shortcomings of a specific model, while getting the opportunity to really participate in the process. This effectively affects students' motivation, interest, and cognitive activity.

Yu. Kuznetsov singles out four modes of computer use: h) mode of passive use - the computer performs only computational tasks; b) reactive dialogue mode - it can be attributed to educational and control systems, when the computer issues tasks and then evaluates them; c) mode of active dialogue - is a combination of the first two; d) interactive dialogue mode - the computer "behaves" more actively compared to the modes mentioned above. At the same time, the computer can conduct a full-fledged dialogue with the student and the teacher, since, according to Yu. Kuznetsov's definition, a new scheme "teacher - computer - student" appears [3]. It should be noted that the existing modes can be applied both independently of each other and all together, depending on what result we want to get.

V. Martynkus, P. Storozhilova, P. Kush, Yu. Taran, N. Akymenko, K. Vuzliv, I. Matyushko, M. Bugaets and others investigated the problems of using computers in the study of energy disciplines. [1].

A necessary condition for the informatization of education is the preparation of the teacher for the use of modern information technologies in the educational process. The latest systems make it possible to build the education process, preserving the main advantages of education under the guidance of a teacher, giving him inexhaustible creative opportunities.

Modern information technologies are increasingly used in medicine, agriculture, space and other areas of human life. The widespread use of computers in industry, science, and education brings radical changes to these fields, stimulates further development and offers modern information technologies.

#### **4.2. Psychological and Pedagogical Problems of Using Modern Information Technologies in the Educational Process of Future Specialists in the Energy Industry**

The implementation of modern information technologies in the field of education changes the forms, content, and means of education, bringing it closer to the realities of modern life. The main task of the teacher in this case is, according to V. Vasiliev, "development of the personality of the student, creative search in the organization of the educational process, selection, development and selection of the best and most appropriate software products for learning." When working on a computer, there are comfortable conditions for active learning, making independent decisions, and simulating real processes. All this is a significant foundation for graduates of higher education institutions. The issue of the development of computer technology was studied by O. Alekseenko, M. Brusentsov, B. Vinogradov, I. Gromov, V. Kotlyarov, L. Korolev, L. Leventhal, V. Bardachenko, Yu. Korolev. Several stages of informatization of education are distinguished. It is clear that the use of the computer in the educational process has led to a change in the means and organizational forms of education. It is possible to use, depending on the wishes of the students, various electronic reference books, illustrative material, methodical advice. These opportunities are offered in any individual capacity: it is possible to vary the student's independent activity in every way; its inclusion in the process of thinking and assimilation of new knowledge takes place in the conditions of communication with a computer; there is an

opportunity to visualize not only the directly obtained result, but also the entire process of thinking; modern information technologies can be used in various forms of educational activity management. The computer itself can be both a passive element and an active one, everything will depend on what role is assigned to users; various new forms of education organization are emerging: distance learning, electronic conferences, chat bots, etc.

Students' activities are also noticeably changing. They get the opportunity to make their own decisions. Without contacting the teacher, they can get the necessary information from the information system and even experiment with it, considering different ways of solving the problem, with partial, full or no computer help. Thanks to a creative search, and what is important - they cannot be afraid to make a mistake: the computer will not allow it. Thus, students are protected from unnecessary emotional stress. Another important aspect is the opportunity to engage in research work, tracing the dynamics of the development of various phenomena and processes.

With the active implementation of modern information technologies, issues related to computer literacy and information culture arise.

Some authors view the problem of computer literacy very narrowly as "mastering the skills to solve problems on a computer." One cannot agree with this because the functions of the computer are not limited to solving problems, because, using computers, you can look up textual information, for example, from various fields of knowledge. Modern information technologies can be used in forecasting, modeling of various phenomena, processes, etc. There is a point of view that computer literacy includes only knowledge about computer capabilities, other researchers call only the practical application of modern information technologies in the development solving complex problems [5–11]. We believe that computer literacy includes knowledge of modern information technologies and their functioning; conditions for more effective application of certain technologies; mandatory knowledge of the Internet and the ability to work in it; knowledge of the use of computers in all areas of human activity; knowledge of algorithmic languages and the ability to use them practically (not only for the physical and mathematical cycle of educational disciplines); ability to work with software products, including text editors; knowledge of computer architecture. In turn, computer literacy gives students knowledge about the impact of general automation on the activities of public institutions.

Intensive implementation of modern information technologies in education actualizes the issue of content, forms of independent work of students. Teachers of higher education institutions are required to pay as much attention as possible to various types of independent work, because they are an important factor in the culture of educational work. Practically all software tools (computer electronic textbooks, hypertexts, expert systems) have some elements of independent work. Scientists V. Glushkov, V. Korzhukov, N. Polyakova and others dealt with the issue of independent organization of educational activities using computers. Organization of independent work of students using a computer can be carried out in several directions at the same time. For example, N. Polyakova singles out the following: "development of

partial algorithms for solving typical problems; development of heuristic prescriptions for non-typical problems; development of educational programs, as a higher degree of algorithmization; individualization of independent works; specialization of independent work taking into account the practical tasks of the specialty; development of systems of abstracts from separate sections of lecture courses; development of special teaching methods; provision of special and reference literature, etc." [5–11].

The practical use of modern information technologies in the educational process provides an opportunity to choose different organizational forms of work – individual, group or collective. This once again refutes the fallacy of the idea that computer-based learning always has only one specific type in terms of organizational form. The use of collective learning activities in the educational process also has advantages. Thanks to such activities, the student can act both as a teacher and as a student. In this case, an educational goal is also assumed, namely: students develop the skills of joint activity, a sense of responsibility for the entire group appears, the ability to respect the opinion of others when discussing the solution to a certain problem. The collective form of education provides an opportunity for communication, discussion of the progress of solving the problem (at the same time, each student expresses his point of view) and its final result. All proposals made during the discussion process are taken into account. The effectiveness of the educational process, especially individual training, increases. The student becomes an object of pedagogical influence and an active subject of educational activity. These problems were investigated by V. Glushkov, V. Krutetskyi, V. Galuzynskyi, V. Naurzokov, I. Rezvytskyi, and others. Therefore, it can be concluded that modern information technologies from the point of view of using organizational forms in the educational process are universal.

Among the primary tasks facing institutions of higher education is increasing the number of computer equipment using modern information technologies (integrated databases and knowledge, text, expert systems, modern software, visual and graphic presentation of information, etc.).

#### **4.3. The Role and Place of Modern Information Technologies in the Individualized Training of Future Specialists in the Energy Industry**

The conditions created with the help of a computer for the individualization of learning should facilitate the formation of connections and patterns. Indeed, only such computer training can be considered effective, which provides opportunities for the formation and improvement of students' mental processes. Based on modern pedagogical and psychological-pedagogical theory, the computer as a new means of distance learning has found its place in the educational process. In addition, it provides an opportunity to individualize the learning process. While working at the computer, students can work at their own pace without experiencing any discomfort, without being oriented towards anyone.

The computer makes significant changes and additions to those tasks used in the traditional approach. Here are possible tasks for modeling, planning, forecasting, simulating various actions, for immersion in a certain environment, where the student,



performing certain actions, himself changes the educational situation. This type of educational activity, such as the presentation of new material, has also undergone significant changes. Different environments have appeared, in particular, such as hypertexts, sound, graphics, animation, when using which all types and forms of educational influence change greatly. The didactic possibilities of graphics are enormously increased due to the fact that the possibility of modeling a three-dimensional image appears. Dialogic interaction of a student with a computer is a necessary condition for the effective use of modern information technologies in the educational process. Like any other communication, "student – computer" communication must meet certain requirements, especially psychological ones. It is necessary to ensure that the educational systems used are as best as possible adapted to communication with students, meet such conditions as flexibility, comfort, simplicity, color, openness, maximum simplification of communication, minimum time spent on familiarization with a certain system, etc.

In the context of the use of modern information technologies in the educational process, the minimum amount of knowledge, skills and abilities of teachers should include: knowledge of safety rules when working with a computer, knowledge of the purpose of the main computer devices – processor, keyboard, display, printer, modem; ability to work with any types of information; ability to work with reference systems; ability to work with basic operating systems; know and be able to work with basic editors (text, graphics, music, etc.); know computer architecture; to know programming languages; be able to deal with new software packages; use in the educational process as wide a range of educational computer systems as possible.

The use of computer technology in the educational process should not change the logic, systematicity and integrity of the material being studied. Before using computer technology in the educational process, the teacher needs to determine the priorities according to which educational information will be provided, appropriate and effective forms, means and types of organization of educational activities. Only such an approach to solving the most important methodological, psychological and pedagogical issues can guarantee the quality and efficiency of the use of computer technology.

It is possible to cite the following positive aspects of the use of computer technology with an individualized approach to the educational process:

- the teacher should not focus on the average level, since it objectively does not exist. Even so-called average students each have their own peculiarities of memory, thinking, imagination, perception, different interests (in this case, of course, some are bored, others do not have time);
- the use of computers in education is a constant and objective control;
- students are given the opportunity not only to answer already formulated questions, but also to formulate them;
- with the help of computer simulators, skills of practical work with any technical equipment are effectively formed;
- an individualized form of organization of education for students is more effective in mastering abilities and skills, deepening theoretical knowledge and



applying them in practical work. With the right approach to the organization of such training, the need for self-education is formed;

- the computer makes it possible to implement reference and informational, communicative, design, and multimedia functions in education. With the help of such a wide range of possibilities when solving problems of various complexity, the information culture of both an individual and society as a whole increase;

- the successful application of modern information technologies and technical means makes it possible to simplify the management of the educational process, etc.

At the same time, there are also negative consequences of using computers in the educational process:

- there is a threat of crowding out communication, which can significantly affect a person's emotional state. A machine will never replace communication with a person;

- the danger of limiting written communication, the development of creative thinking (an algorithmic structure is a characteristic feature of computer training programs), the exchange of experience (the experience gained personally during training does not become the property of everyone), excessive communication with the computer leads to negative consequences (closedness in communication with people, fatigue, visual impairment, etc.);

- it is necessary to remember that the educational process with the use of modern information technologies must be interspersed with group and collective forms of education.

#### **4.4. Methodical Aspects of the Application of Modern Information Technologies in the Educational Process of Future Specialists in the Energy Industry**

One of the variants of developmental education in didactics is problem-based learning. Its goal is not only the assimilation of the results of scientific knowledge and the knowledge system, but also the search for solutions. With this help, the student's cognitive independence is formed and his creative abilities are developed. Problem-based learning is an optimal combination of reproductive and creative activity associated with the assimilation of a system of scientific concepts and techniques, methods of logical thinking. With the introduction of modern information technologies into the educational process, it became possible to significantly increase the activity of students, to ensure the cyclical functioning of the traditional "teacher - student" relationship on a real scale and in time. Thanks to this, it became easier to implement the main principles of developmental education: individualization and differentiation. In addition, although the computer allows you to make mistakes, it helps you learn about the system of concepts and knowledge through contradictions.

It is advisable to use modern information technologies for classical testing during distance education, and in any field. According to psychologists, provided a competent approach, it is the tests during distance education that can help reveal the level of development of the skills of future specialists in the energy industry to perform substantive and logical thinking operations.

The system is successfully used in the educational process. With its help, tasks are checked, Olympiads are held online and students' knowledge of energy disciplines is tested. What is more, this system is constantly replenished. But the bank of tasks and tests on energy disciplines, the verification of which is automated, allows you to consider it a computer problem solver that can be used only to improve the quality of teaching energy disciplines during distance education.

The experience of using an electronic textbook in the educational process and during preparation for Olympiads allows us to assert the need for such systems for many teachers of energy disciplines. They increase the efficiency and intensity of classes several times, and also increase the interest of students in energy disciplines.

Today, two approaches to informatization of education are considered the most promising in the world. The first is related to "the design and computer implementation of subject-oriented educational environments that provide advanced modeling of the content of study objects and the creation of integrated educational subjects (USA, France, Japan). Another approach is related to the formation on the basis of the mentioned environments of models of joint and individual cognitive activity, which are based on the processes of communication and broad interaction between students, between teachers and students (USA, England, France, Finland, Ukraine).

We support the opinion that the latter approach contributes to the implementation of a more active approach to education, reveals the originality of modern information technologies as a means of organizing and developing cognitive, search-research, intellectual-creative work, contributes to the formation of experience in various forms and types of activities, experience of emotional and valuable attitudes towards world, communication experience. In this context, the research activity of students at all its stages becomes effective in the conditions of replacement and modernization of traditional methods of information education of students with a more diverse and systematic use of modern information technologies. The basis for such a position is our understanding of the specific features of the computer and the effectiveness of the influence of modern information technologies on the optimization of pedagogical processes, including:

- providing access to an almost unlimited amount of information and methods of its analytical processing, which provides a sharp quantitative increase in the amount of potentially available information and the speed of its acquisition and leads to a qualitatively new step – the emergence of the phenomenon of "direct inclusion" of a person in the information culture of society;

- provision of a new, active form of fixation of the products of mental human activity. In contrast to all previous means of objectifying a person's mental activity, which only created prerequisites for the transformations performed by the person himself (analysis of individual aspects of the content of knowledge, comparison with already known data, supplementing data with new information from other fields, using specific actions for the organization and systematization of information, etc.), the use of modern information technologies for the first time makes it possible to fully perform and partially automate these transformations;

- the use of modern information technologies becomes the next most important, after traditional writing, a symbolic tool that facilitates the prompt exchange of information in accordance with the content of the activity. Thus, a fundamentally new field of human use of language and sign-symbolic means of activity appears;

- the use of modern information technologies makes it possible to enter into a constructive meaningful dialogue with the user and to form a single functional subject-oriented environment with him. Thus, modern information technology not only increases a person's intellectual capabilities, affects his memory, emotions, motives and interests, but also changes and rebuilds the very structure of a person's cognitive, and later productive and creative activity.

Modern forms of organizing students' educational activities and effective pedagogical interaction require the creation of appropriate conditions. Among them, it is worth highlighting those that provide the widest possible access to information flows and methods of its processing, which, in turn, is achieved by the effective and systematic use of modern information technologies. These functions can be provided by the network of information environment created in institutions of higher education, which provides for the construction of logically rigid targeted flows, arrays of information and software tools for the performance of educational, developmental and management tasks. Among the components of the network of the information environment of the institution of higher education, the following should be highlighted:

- a full-fledged multi-functional media library, which serves as a basis for conducting classes, optional classes, circles, courses of the students' free choice and includes multimedia, interactive educational programs on various subjects, branches of science and culture, designed for different age categories of students;

- an online library that provides ample opportunities for all participants of the educational process to use information systematized by sections; creates conditions for distance learning – participation in training courses, competitions, Olympiads, creative projects;

- an editorial center that ensures the creation and maintenance of websites, the publication of university newspapers, theses of student research works, leaflets, training manuals, the preparation of printed materials for use in classes, seminars, conferences, during the defense and presentation of scientific works;

- a library of working databases, which are the generalized results of the work of teachers, students, psychologists from various aspects of diagnosis (testing, surveying, questionnaires, etc.), organization and implementation of research activities in a higher education institution;

- a catalog of information databases that contain organizational, methodological and consulting information regarding the implementation of research and research work at all its stages (recommended topics, information about libraries, structure, stages, methods of research and research work, methodological advice, etc.).

It is possible to formulate the following advantages of informatization of the educational process:

– modern information technologies make it possible to control the individual pace of educational activity: the student has the opportunity to independently choose the moment of transition to the next portion of educational information, set the speed of presentation of tasks, the time of solving the task. At the same time, modern information technologies can serve as a certain regulator, warning the student that his pace of work is either too satisfactory or unreasonably fast;

– modern information technologies allow the student to independently move from a higher degree of difficulty of the educational material to an easier one and vice versa. The student chooses and determines for himself the degree of difficulty of the educational task. There is an opportunity to try your hand at different levels of difficulty and take into account gaps in the assimilation of educational material;

– the visual role of modern information technologies is unique. The visual effects of the computer, which can be used to demonstrate the processes and phenomena being studied, are of great importance. Computers make information visible, thanks to this, fundamentally changing human communication, because the image (animation, graphics) becomes the carrier of information.

The analysis of the experience of using modern information technologies in institutions of higher education, in particular, in practical classes, makes it possible to draw some conclusions about the problems of using modern information technologies in the process of activating the cognitive activity of students when implementing an individualized approach in education. The use of modern information technologies makes it possible:

1) to intensify and rationalize the time spent in traditional education on demonstration moments, searching for information, on the individual pace of work with theoretical material;

2) increase the efficiency of the educational process as a result of processing a large amount of educational information necessary for each student;

3) develop cognitive activity, increase the efficiency of independent work, interest in the subject being studied;

4) establish the relationship necessary to manage the educational process, systematically control the knowledge and skills acquired during the processing of educational material, increase the level of knowledge verification;

5) to improve the forms and means of organizing independent, differentiated, individual, individualized work of students;

6) to individualize the educational process, applying a separate methodology embedded in modern information technologies for the model of each student, which allows taking into account the individual characteristics of the student, developing abilities, increasing the quality of assimilation of knowledge and necessary skills.

Working with modern information technologies and mastering a certain educational course, the student simultaneously acquires and practices the skills of working with electronic computing technology, which in recent decades has acquired a constantly growing role in all spheres of human activity. The use of modern

information technologies in the educational process can be not only a means of learning, but also a subject of study.

However, not all problems and issues in the educational process should be solved by using modern information technologies. It is necessary to take into account the principle of pedagogical expediency when using certain means. Having as a starting point a specific didactic goal of a certain educational material and a specific model of the student, it is necessary to choose forms and means of education that would stimulate the active cognitive activity of students.

The main factors contributing to the effective implementation of individualized work with students are:

- giving clear instructions by the teacher on the systematic use of an individualized form of education during classes;
- development of theoretical educational material in accordance with the didactic principle of accessibility;
- development of a system of special tasks for an individualized form of education that correspond to educational plans and programs taking into account the specifics of each academic discipline;
- carrying out systematic control in the case of an individualized form of education;
- taking into account the complex of individual and psychological characteristics of students when organizing individualized training;
- taking into account psychological and pedagogical conditions in the development of software products that will be used in individualized training.

At the same time, the criteria for the effectiveness of the individualization of the educational process are:

- steady assimilation of knowledge by a student from a certain energy discipline;
- the ability to use theoretical provisions of educational information in practical work;
- the ability to work independently with educational and additional literature;
- the ability to individually study and master the proposed educational material.

The difficulty of determining the didactic conditions for the effective use of modern information technologies with an individualized approach to education is caused by the lack of a single point of view on the definition of the concept of individualization of education, specific features, functions and ways of its implementation in the conditions of informatization of education.

Also, there is no single point of view on the definition of specific signs of individualization of its educational and educational results.

O. Kirsanov calls the core of the theoretical concept of individualization of educational activity "three main categories: personality, activity, development". The main components that make up the educational process are the transfer of knowledge, work experience, and emotional and value relationships.

None of the currently existing psychological and pedagogical theories of learning can fully and properly explain the patterns of informatization of education. One of the



reasons for this situation, according to V. Panchenko, is that information activity "leaves an imprint" on all types of cognitive processes, therefore this aspect of the problem provides great opportunities for the research work of psychologists and teachers.

Among the various aspects of studying the informatization of education (philosophical, social, methodological, etc.), the main and essential one is called psychological and pedagogical.

The emergence of new modern information technologies of education, including the use of computer technology, also led to the emergence of new forms of organization of the educational process, in which the student acts as an object of educational activity. The computer solves quite complex problems with the help of heuristics. At the same time, the student's status changes, he realizes himself as a person who independently makes certain decisions and is responsible for the obtained result. And this opens up new horizons in the practical implementation of the principle of humanism and humanization in education when using modern information technologies.

The computer has been used as a learning tool for almost 65 years. And during this time of its use, the functions and didactic possibilities changed, the psychological side of using such a tool received a more serious approach. Applied computer products (educational systems, shells, environments) have also undergone changes, and their capabilities and functions have also changed.

The use of modern information technologies in the educational process is traditionally characterized by two ways:

- interaction of the student with the computer, the educational process takes place, as a rule, without the intervention of the teacher, since the student receives all the necessary information only from the computer, communicating with it in a convenient mode. The only possible intervention of the teacher is when an unforeseen situation arises due to an imperfect software product and the computer is unable to do anything;
- the teacher's interaction with the computer. In this case, the computer can be used as an assistant in the organization of the educational process or perform a control function. It can issue results after the students have completed certain work, compare them, make calculations.

Modern information technologies of education bring significant changes to the activity of the teacher. His place in the educational process is largely determined by the chosen educational system, and depending on the functions performed by this system, the teacher's functions are also determined. The successful use of modern information technologies places new demands on the teacher's professional competence.

Thus, the use of modern information technologies in the educational process and the construction on their basis of the network of the information environment of the institution of higher education provides conditions for a qualitatively new level of organization and implementation of research activities of students, which, in turn, contributes to their formation as creative personalities.

### References

1. Жалдак М. І., Хомік О. А. Формування інформаційної культури вчителя. *International Charity Foundation for History and Development of Computer Science and*



*Technique ICFCST* : веб-сайт. URL: <http://www.icfcst.kiev.ua/> (дата звернення: 13.03.2023).

2. Закон України «Про національну програму інформатизації». *Голос України*. 7.04.1998.

3. Мараховський Л. Ф. Проблеми методичного забезпечення з дисципліни «Інформатика та комп'ютерна техніка». *Збірник «Запровадження сучасних технологій навчання в КНЕУ*. Київ : КНЕУ, 1999.

4. Моїсєєв Б. «Епоха ПК завершується», – так вкотре напропорочили лідери світової ІТ-індустрії. *Газета української буржуазії БІЗНЕС*, 27.11.2000.

5. Onyshchenko S. New Information Technologies in the Conditions of Distance Education. *Наукові записки Бердянського державного педагогічного університету. Серія: Педагогічні науки : зб. наук. пр. Випуск 3. Бердянськ : БДПУ, 2022. С. 172–178.*

6. Onyshchenko S. Visual Means in the Educational Activity of Professional Teachers of the Professional Education System. *Scientific and research work in the system of teacher training in natural, technological and computer spheres : materials of VIII international scientific conference (with the international participation), Berdyansk, September 16-17, 2021. Berdyansk : BSPU, 2021. Р. 213–215.*

7. Онищенко С. В. Використання ІКТ в педагогічній діяльності вчителя-предметника. *Неперервна освіта нового сторіччя : досягнення та перспективи : збірник наукових праць ЗОПППО за матеріалами II Міжнародної науково-практичної конференції (18-25 квітня 2016 р.). 2016. № 2 (24). С. 74–78.*

8. Онищенко С. В. До проблеми викладання технічних дисциплін при підготовці спеціалістів за напрямом «Професійна освіта. Енергетика». *Наукові записки Бердянського державного педагогічного університету. Серія: Педагогічні науки : зб. наук. пр. Випуск 2. Бердянськ : БДПУ, 2022. С. 304–310.*

9. Онищенко С. В. Місце дисциплін енергетичного циклу у формуванні професійної компетентності студентів енергетичних спеціальностей. *Development strategiest for modern education and science : Materials of the III International research and practical internet conference (February, 28, 2022) : collection of abstracts. Zdar nad Sazavou : «DEL a.s.», 2022. Р. 27–30.*

10. Онищенко С. В. Технологія формування професійної компетентності майбутніх учителів технології. *Науково-дослідні публікації. Серія «Інформатика і техніка»*. 2014. № 7 (11). С. 44–52.

11. Онищенко С. В. Формування професійної компетентності майбутнього вчителя технології засобами інформаційно-комунікативних технологій. *Науковий часопис Національного педагогічного університету імені М. П. Драгоманова. Серія №5. Педагогічні науки: реалії та перспективи. Випуск 31. Київ : Вид-во НПУ імені М. П. Драгоманова, 2012. С. 154–159.*

12. Рябченко В. А. Деякі концептуальні проблеми освіти і виховання студентів в сучасних вищих навчальних закладах України. *Вища освіта України*. 2005. № 3. С. 40–45.

experiences, irrational fear, a constant feeling of anxiety, depression are often accompanied by an increase in religious activity in the media.

**Keywords.** religion, media, emotions, emotional well-being, crisis, pandemic social restrictions.

## **2.2. Oksana Shpak INNOVATIVE APPROACH IN TEACHING STRUCTURE**

The essence of pedagogy in the 21st century, the main methods, factors and goals of modern education are considered. It is described what role emotional intelligence plays in innovative education. It is considered which information and communication technologies should be used in the digital era of computerization. Applications are presented that are appropriate to use in the educational process. The diagram of the survey of students regarding the choice of the form of education is given.

**Keywords:** pedagogy, innovative education, educational activity, educational process.

## **CHAPTER 3. MODERN TRENDS IN THE DEVELOPMENT OF LINGUISTICS AND PHILOLOGY**

### **3.1. Tetiana Ivanova DEVELOPMENT OF THINKING AND FOREIGN SPEAKING COMPETENCE DURING STUDENTS LEARNING SPECIAL TERMINOLOGY IN LATIN AND FOREIGN LANGUAGES**

The article considers the problem of professionally oriented foreign language training (English and Latin) for medical students, which is becoming particularly relevant in connection with the growing role of foreign language communication in the professional activities of modern specialists. The main task of the department of "Latin language" and "Foreign language" of the medical university is the formation of the ability of medical students to use language as a means of professional communication and self-education. In the process of studying these fields, the ability and desire to analyze socially important issues, they use in practice the methods of humanitarian, natural, medical, biological and clinical sciences in various professional and public activities. The Latin language, like foreign languages, is an inexhaustible source of development of the cultural and professional perspective of a medical student.

**Key words:** thinking, professional terminology, medical students, professional skills, challenge, reflection, bilingualism, Latin language, foreign language.

## **CHAPTER 4. Serhii Onyshchenko PSYCHOLOGICAL AND PEDAGOGICAL FOUNDATIONS OF THE APPLICATION OF MODERN INFORMATION TECHNOLOGIES IN THE EDUCATIONAL PROCESS OF FUTURE SPECIALISTS IN THE ENERGY INDUSTRY**

In the section of the monograph, the scientific psychological-pedagogical literature on the research problem is analyzed, the psychological-pedagogical problems of using modern information technologies in the educational process of future specialists in the energy industry are analyzed. The role and place of modern information technologies in the individualized training of future specialists in the energy industry is determined, and the methodical aspects of the application of modern information technologies in the educational process of future specialists in the energy industry are analyzed.

**Keywords:** modern information technologies, educational process, energy disciplines, informatization of education, distance education.

## ABOUT THE AUTHORS

### **CHAPTER 1. MODERN BASICS OF ECONOMICS, MANAGEMENT AND TOURISM**

**1.1. Mykola Odrekhivskyi** – Doctor of Sciences (Economic), Professor, National University «Lviv Polytechnic»

**Orusia Phsyk-Kovalska** – PhD (Economics), Associate Professor, National University «Lviv Polytechnic»

**1.2. Olha Podra** – Ph.D in Economics, Associate Professor, Associate Professor of the Department of foreign trade and customs, National University «Lviv Polytechnic»

**Nataliia Petryshyn** – Ph.D in Economics, Associate Professor, Acting Head of the Department of foreign trade and customs, National University «Lviv Polytechnic»

**1.3. Olena Serhieieva** – Ph.D, Associate Professors of International Trade and Entrepreneurship Department, Alfred Nobel University, Dnipro

**Halyna Ryzhkova** – Ph.D, Associate Professors of International Trade and Entrepreneurship Department, Alfred Nobel University, Dnipro

### **CHAPTER 2. INNOVATIVE AND MODERN FOUNDATIONS OF PEDAGOGY AND PSYCHOLOGY**

**2.1. Natalia Kostruba** – PhD in psychology, Associate Professors, Lesya Ukrainka Volyn National University

**2.2. Oksana Shpak** – Ph.D, assistant, Lviv Polytechnic National University

### **CHAPTER 3. MODERN TRENDS IN THE DEVELOPMENT OF LINGUISTICS AND PHILOLOGY**

**3.1. Tetiana Ivanova** – teacher department of foreign languages professional communication, Faculty Linguistics and Translations, International humanitarian university

### **CHAPTER 4. PSYCHOLOGICAL AND PEDAGOGICAL FOUNDATIONS OF THE APPLICATION OF MODERN INFORMATION TECHNOLOGIES IN THE EDUCATIONAL PROCESS OF FUTURE SPECIALISTS IN THE ENERGY INDUSTRY**

**4.1., 4.2., 4.3., 4.4. Serhii Onyshchenko** – PhD, Associate Professor, Berdyansk State Pedagogical University

### **CHAPTER 5. ANALYTICAL REVIEW OF ANTIBIOTIC USE PROBLEMS AND ANTIBIOTIC RESISTANCE**

**5.1., 5.2. Olha Shved** – c.ch.s., Assistant Professor, Assistant Professor Department of technology of biological compounds, pharmacy and biotechnology, Institute of Chemistry and Chemical Technologies, Lviv National Polytechnic University

**Zoriana Hubrii** – c.ch.s., Assistant Professor, Assistant Professor Department of technology of biological compounds, pharmacy and biotechnology, Institute of Chemistry and Chemical Technologies, Lviv National Polytechnic University

**Veronika Chervetsova** – c.b.s., Assistant Professor, Assistant Professor Department of technology of biological compounds, pharmacy and biotechnology, Institute of Chemistry and Chemical Technologies, Lviv National Polytechnic University

**Scientific Edition**

**Series of monographs Slovak publishing house NES Nová Dubnica s.r.o.**

**Monograph 1**

**European Vector of Modern Education,  
Science and Production – 2023**

**Collection of abstracts**

*The authors are responsible for the selection, accuracy of the  
facts, quotations and other information*

---

Publishing House NES Nová Dubnica s.r.o.  
M.Gorkého 820/27, P.O.BOX  
018 51 Nová Dubnica, Slovenská republika  
tel. +421-42-4401 209



# NES NOVÁ DUBNICA S.R.O.

ISBN 988 – 963 – 8454 – 15 – 3 - 3S

Publishing House NES Nová Dubnica s.r.o.

M.Gorkého 820/27, P.O.BOX

018 51 Nová Dubnica, Slovenská republika

tel. +421-42-4401 209