Optimization of the Educational Environment Using Information Technologies

Mykhailo Sherman [†]**, Yaroslav Martynyshyn** [††]**, Olena Khlystun** [††]**, Liubov Chukhrai** [†††]**,
Yuliia Kliuchko**[†††]**, Uliana Savkiv** [††††]

Maxnik8888@gmail.com

[†] Department of informatics, program engineering and economic cybernetics, Kherson state university, Ukraine
[††] Department of Show Business Management, Kyiv National University of Culture and Arts, Ukraine
[†††] Department of Museology and Examination Process of Historical and Cultural Sites, Kyiv National University of Culture and Arts, Ukraine
[††††] Department of Accountancy and Audit, Vasyl Stefanyk Precarpathian National University, Ukraine

Summary

The article analyzes and shows the rapid development information and telecommunication technologies, and their capabilities are becoming unprecedented for human development, effective solutions to many professional problems.

The analysis of information and communication technologies of education used in higher educational institutions of Ukraine confirmed that for the effective use of special teaching methods, as well as software and technical teaching aids, it is necessary to have a trained teaching staff and students.

Key words:

information technology, communication technologies, education system, educational process, optimization.

1. Introduction

At the beginning of the twenty-first century, humanity entered the stage of transition to an information society. This term appeared in the first half of the 1960s in Japan and America in the works of Tadao Umesao and Fritz Machlup [2]. The most important feature of the new formation is that information and communication technologies (ICT) are being actively introduced into all spheres of society.

Information and communication technologies are understood as a set of mechanisms and devices, as well as methods of storing, processing and transmitting information [3].

From the point of view of the development of education, as one of the main forms of activity of human society, the introduction of ICT seems to be a natural step in the development of existing teaching technologies [6].

This is also confirmed by the fact that it is education in the twenty-first century that is the key to overcoming the global challenges of our time, such as poverty, social inequality, security peace for all peoples and many others.

Today the concept of "teaching technology" is not generally accepted in traditional pedagogy. The status of the teaching technology has not yet been determined.

Some experts [1, 2, 8, 9] consider it as a pedagogical science, others [7, 14] believe that it is occupies an intermediate position between science and practice. On the one hand, teaching technology is a combination of methods and means of processing, presenting, changing and presenting educational information, and on the other hand, it is the science of how the teacher influences students in the learning process using the necessary technical or information media. The most succinct sense of the term "technology of teaching" is conveyed by the following definition. Learning technology is a way of implementing the learning content provided by the curriculum, representing a system of forms, methods and teaching aids, ensuring the most effective achievement of the set goals [9]. So, in teaching technology, the content, methods and means of teaching are interconnected and interdependent. Pedagogical the teacher's skill is to select the right content, to apply the best teaching methods and means in accordance with the program and the set pedagogical tasks. In our opinion, the essence of learning technology is that all

Methods, dialogue forms, techniques and teaching aids should be considered as a methodological system that allows consistently, dialectically to implement specifically set didactic goals and objectives for each lesson. At the same time, the problem must be solved enhancing the educational role of the didactic environment, maintaining the atmosphere of the cult of learning, high responsibility for the results of the cognitive activity of students.

In teaching technology, the following main links can be distinguished [8]:
- setting goals and objectives and their maximum clarification;
- training content;
- organization of the educational process to fulfill these goals;

- the use of the existing arsenal of methods, forms, techniques and means to guarantee the achievement of a positive result;
- motivation and stimulation of learning;
- current monitoring of cognitive activity students;
- correction of the educational process;
- control and analysis of the effectiveness of the resulting final result.

Thus, for the effective use of software and technical teaching aids, it is necessary to have a teaching staff and students prepared for the use of ICT.

2. Theoretical Consideration

In dictionaries and encyclopedias, optimization is defined as finding the largest or smallest value of a function or choosing the best (optimal) option from a set of possible ones [12].

"The principle of optimality makes requirements of rationality, rationality, a sense of proportion in the application of all elements educational process. It calls for the greatest possible results with the minimum required investment of time and effort. This is its great humanistic significance "[12].

Optimization of the educational process at the university can be considered as one of the leading directions of its restructuring and improving the quality of vocational training of graduates through the improvement of pedagogical work, targeted improvement content, forms, means and methods of teaching, improving the structure of academic disciplines and enhancing the cognitive activity of students while maintaining the established terms of study.

Optimization of the educational process is not only a pedagogical problem, but also a strategic task of changing the possibilities of increasing the volume of information capacity of educational material with constant training periods and the use of modern achievements of scientific and technological progress. In short, it is a search for ways that would increase the pace of learning without reducing the quality of higher education. To solve such a problem, the introduction of more advanced, scientifically grounded teaching technologies and the mobilization of the creative abilities of the personality of students and the teaching staff is required.

The essence of training optimization is to improve the quality of professional training in the best possible timeframe and at the lowest cost.

Consequently, the optimization of teaching in higher education is the creation of such conditions under which students, within the established terms of study, receive more knowledge, skills and abilities necessary to fulfill their functional duties, assimilate them deeper and more firmly.

Thus, we can say that the optimization of the educational process at the university is the central direction of its improvement, used to improve the quality of training of specialists through the effective work of students and the teaching staff, purposeful improvement of the content, improvement existing traditional ones, as well as the introduction of new active methods, forms, teaching aids, improving the management and structure of studying academic disciplines and their elements, enhancing the cognitive activity of students while maintaining the established terms of study [9, 14, 16].

Optimization of the educational process should ensure the strengthening of the fundamentality and practical orientation of student learning;

raising the ideological, theoretical and methodological level of teaching;

enhancing the cognitive activity of students; improving the organization of the educational process and management of the transfer and assimilation of knowledge, the formation of skills and abilities; introduction of new forms, methods, methods of training and education; improving the individualization of training, self-education and self-education of trainees; all-round intensification of research work.

Generalization of the results of scientific research and the experience of educational innovators [9, 12] allows us to name the main factors influencing the optimization of learning:

increasing its focus; increased motivation for learning; increasing the information content of the content of education;

the use of active forms and methods of teaching; accelerating the pace of acquiring professional skills; development of skills for independent educational work; the use of computers and other new technical teaching aids.

Optimization of the educational process can be achieved by improving the two main components of the educational process [9]: content and procedural.

Optimization of the content side of the educational process is determined [12]:

- the nature of the professional activity of graduates, the modern level of scientific and technological progress;
- establishing a close connection between academic disciplines and active use of scientific knowledge of some subjects in the study of others;
- improving the quality of students' independent work;
- active participation of the teaching staff in research activities and the application of its results in teaching;
- computerization and informatization of education;
- increasing the informative capacity of the content of each type of occupation.

Thus, one of the directions for optimizing the educational process in the field of its content, associated with the use of information and communication technologies, is

computerization and informatization of education. Now it is difficult to name any area where the use of information technology does not bring tangible results. Today, the computer already examines trainees using tests, gives an opinion about the character of a specialist, his ability to manage a team, etc. The capabilities of computers are growing rapidly.

Optimization of the educational process involves solving such an important problem as increasing the informative capacity of the content of each type of activity, since the flow of information is growing at a significant rate.
Here are some indicators. Since the beginning of our era, the first doubling of knowledge in society occurred by 1750. The second doubling - by the beginning of the XX century, the third - by 1950. From that moment on, the amount of human knowledge has doubled every 10 years, since 1970 - every 5 years [2], and since 2010 - every two years.

It is believed that the amount of knowledge in the world by the beginning of the 21st century has increased more than 250 thousand times.

In recent psychological and pedagogical research great importance is attached to new approaches to the selection of educational material, its informative capacity [16].
In the context of an increasing flow of scientific information, it is advisable presentation of educational material in which trainees first learn some general questions of content and then consider it more specifically.
Analysis of the best practices of educators-innovators and experimenters [9, 12] allows us to give the following recommendations for increasing informative capacity of some types of training sessions:
- strengthening the content, practical orientation of each type of occupation;
- a comprehensive solution to educational, upbringing, developing functions of training and psychological preparation, trainees for professional activities;
- increasing the informative capacity of the lesson due to maximum saturation of the content while maintaining it availability;
- supply of material in enlarged blocks, strengthening the role generalizations in the process of studying the material;
- showing the importance of theory in the content of education;
- expanding the application of the deductive approach in the presentation educational material;
- strengthening of interdisciplinary ties;
- improving the selection of exercises so that, with their minimum solve a wide range of educational and developmental problems;
- the use of algorithms in the learning process;
- the use of computer technology;
- the formation of educational skills and abilities;

concentration of attention on the assimilation of the main categories,
concepts, abilities and skills, etc.
All this requires a new approach and style of thinking from the teacher, focusing on the intensive solution of the tasks facing higher education.

These are the main topical problems of optimization of the content side of the educational process on the basis of information and communication technologies in higher education.

The procedural side of the optimization of the educational process, this integral part of the educational process of higher educational institutions, as well as the content, has a significant impact on the quality of vocational training. Training level of trainees is directly dependent on the knowledge, skills and professorship of the teaching staff of the new teaching technology. He will have to re-understand his role in the educational process of a higher educational institution, deeply comprehend not only meaningful, but also the procedural side of learning, to master the methodology of organizing, guiding and managing the cognitive activity of students, their training, self-education, self-education, self-development. All this leads to the need to master the pedagogical technology of education, including the use of information and communication technologies. Optimization of the educational process is unthinkable without solving such an important and urgent problem.

But the educational process based on information and communication technologies, like any educational process, is subject to the laws and patterns of learning. Objective character of these patterns emphasizes that they always exist in the educational process, regardless of whether teachers and students know about them or not. The laws of the learning process express the basic, essential, fairly stable connections and relationships between components of the training system. The characteristic of the patterns is the general nature, the multiplicity of distribution, they explain the state of the learning process on the basis of finding moreь rational ways and possibilities of their application.

In the educational process, there should always be a feedback that allows you to adjust the educational process, thereby optimizing it.

Thus, for a deeper study of the educational process based on information and communication technologies, it is necessary to build a model for improving the quality of the educational process formed on the basis of information and communication technologies, and for its timely adjustment, develop a methodology for organizing vocational training using information and communication technologies.

Thus, on the one hand, the optimization of educational process is possible through the pedagogical design of the educational process using information and communication

technologies, and on the other hand, the state policy in the field of education in Ukraine shows that in order to modernize vocational education and ensure its high quality.

Conclusions

The analysis of the computer literacy of the teaching staff showed that not all teachers are ready for the widespread introduction of computer technologies in the educational process of higher education. Only 23.3% of the faculty owned a computer at the experienced user level and 72.7% teachers still use the computer as users of office programs. In turn, the analysis of students' computer literacy showed that a significant percentage of students are ready for a wide the introduction of computer technologies in the educational process; only 65% of students use a computer as users of office programs, and 35% showed computer skills at the level of an experienced user, in differences from the teaching staff, whose level of computer literacy is growing at a slower pace, which, in our opinion, is one of the reasons for the insufficient implementation of information and communication technologies in the educational process of higher education institutions of Ukraine. Professional competence of students suggest the widespread use of special software tools for analysis and support of management decisions, the share of which has increased to 20%, they need to be studied by both students and faculty [3]. This confirms once again that computer technologies are increasingly being introduced into the educational process high school.

References

[1]   Gofen A., Blomqvist P. Parental entrepreneurship in public education: a social force or a policy problem? Journal of education policy, 2014, № 29 (4), pp. 546–569. 61.

[2]   Grant W. Pressure Groups, Polities and Democracy in Britain. Homel Hempstead, Harvester Wheatsheaf, 2011, 230 p.

[3]   Meera N. S. Quality education for all? A case study of a New Delhi government school, Policy futures in education, 2015, № 13 (3), pp. 360–374.

[4]   Sosenski S. Financial Education for Children: School Savings Programs in Mexico (1925–1945), Historia Mexicana, 2014, № 64 (2), pp. 645 – 662.

[5]   Alfred P. Rovai, Linda D. Grooms The relationship of personalitybased learning style preferences and learning among online graduate students // Journal of Computing in Higher Education. - 2004. - №16, Issue 1. - pp 30- 47.

[6]   Andrea Santo-Sabato, Marta Vernaleone From the First Generation of Distance Learning to Personal Learning Environments: An Overall Look // ELearning, E-Education, and Online Training. - 2014. - №138. - C. 155-158.

[7]   Chad D. Ellett, Karen S. Loup, RIta R. Culross, Joanne H. McMullen, John K. Rugutt. Assessing Enhancement of Learning, Personal Learning Environment, and Student Efficacy: Alternatives to Traditional Faculty Evaluation in Higher Education // Journal of Personnel Evaluation in Education. - 1997. - №11, Issue 2. - pp. 167-192.

[8]   McMillan R. Man Builds Twitter Bot That Humans Actually Like. Wired. URL: wired.com/2012/06/twitter_arm/

[9]   Ktepi B. Deception in political social media // ed. K. Harvey. Encyclopedia of social media and politic. Vol. 4. Thousand Oaks, CA: SAGE Publications. P. 357-359.

[10]   Kotler P., Lee N. Corporate social responsibility: Doing the most good for your company and your cause. Hoboken, New Jersey: John Wiley & Sons, Inc., 2005.

[11]   Rampton S ., Stauber . J . Trust us! We're experts: How industry manipulates science and gambles with your future . Tarcher. 2002.

[12]   Dordick H.S., Wang G. The Information Society: A Retrospective View. Newbury Park — L., — 1993.

[13]   Knowledge management e e-learning in ambito sanitario / M. Masoni, M. R. Guelfi, A. Conti, G. F. Gensini, - Milan: Springer, 2011. - pp 65-72.

[14]   Mary Webb. Pedagogy with information and communications technologies in transition // Education and Information Technologies. - 2012. - №19, Issue 2. - pp 275-294.

[15]   Priya Sharma, Sebastian Fiedler. Supporting self-organized learning with personal Webpublishing technologies and practices // Journal of Computing in Higher Education. - 2007. - №18, Issue 2. - pp. 3-24.

[16]   Tine van Daal, Vincent Donche, Sven De Maeyer The Impact of Personality, Goal Orientation and Self-Efficacy on Participation of High School Teachers in Learning Activities in the Workplace // Vocations and Learning. - 2014. - №7, Issue 1. - pp 21-40.