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UPDATING EDUCATION MODELS IN HIGHER EDUCATION INSTITUTIONS IN UKRAINE

In our research, we tried to analyze the issue of updating educational models in higher education institutions of Ukraine. Well-known scientists V. Andrushchenko, V. Bykov, A. Gurzhiy, L. Kartashova, V. Kremen, V. Madzigon, V. Nikolaenko, V. Radkevich, O. Spirin, who introduce innovative forms of management of educational institutions, emphasize this in their research.

In the process of research, we identified three main aspects of changes in the digitalization of the educational process: teachers have great opportunities to individualize learning in the updated content of the educational process; students receive relief in the use of IT, expect from teachers the ability to teach integrated integrated learning content of disciplines; Higher education institutions radically change the concept of educational institution management under the condition of integration of general digitalization into education, where the role of both teacher and student changes.

Key words: education, educational-professional level, innovative forms of management, information model of education, digitalization model of education, ,telecommunication means, telecommunication networks , distance education systems.

The constant growth of scientific information, the increase in the social function of the

individual, its intellectualization of labor, the rapid change of technology and technology require the necessary development, modernization of education, bringing its content and capabilities in line with the socio-economic needs of society, deepens, with the personal requirements of a person who seeks to win education. V. Kremen underlines: «Education is crucial for the formation of intellectual potential, building a democratic society, and obtaining the knowledge necessary to improve all spheres of life... Today, knowledge has become the most important factor in economic development» (*Kremen, 2008: 9, p. 29*).

Now education is viewed as a social fact, in several ways:

- as a system that provides an educational level;

- as a process of assimilation by a person of the total social experience, norms, values, obtaining knowledge (any final products of the education process) by persons who will master education);

- as an educational or educational-professional level of individuals (General education level, Junior specialist, Junior bachelor, bachelor, master);

- as a form (full-time, evening, extramural, distance learning), in which individuals acquire education at a particular level;

- as a value (of an independent personality that is inherent in the person who possesses it);

- the basis of society, reflecting the level of education of each of the elements and revealing the world's potential;

- as a socio-economic structure of society – educational institutions, scientific institutions, management bodies, public organizations that characterize the state's personnel potential);

- as an innovative form of public consciousness management.

In the existing practice of educational institutions, an innovative form of management is now being introduced – «information model of education, digital model of education, the purpose of which is education itself – obtaining knowledge specially selected for mastering the basics of implementing science, systems, the principle of accessibility, by various innovative, information means, and using computer and digital technologies».

Famous scientists V. Andrushchenko, V. Bykov, A. Gurzhiy, L. Kartashova, V. Kremen, V. Madzigon, V. Nikolaenko, V. Radkevich, O. Spirin, who introduce innovative forms of management of educational institutions, emphasize this in their revisions, more significantly this problem was defined by V. Bykov, who believes: «education can be presented in various models, which», «depending on the purpose of consideration and further use of the constructed models, reflect both the individual aspects of its consideration and their totality, thereby determining the essential objects and relationships that characterize them in each specific case» (*Bykov, 2019: 3*).

In-depth modeling of systems of education and training not only develops the theory of construction and operation of these systems, which in itself has great value, but also allows to define such a constitutive entity-relationship systems training and education, these properties, which strongly affect qualitative characteristics of these systems allow to generate requirements for components with the latest achievements of science and practice, in particular methods and means of information and communication technologies, e-distance learning technologies, progressive psycho-pedagogical methods of teaching, education and upbringing, on which open education systems are based. This approach lays the theoretical and methodological foundation, provides the necessary scientific and methodological conditions for creating education and training systems at the current stage of their development.

In our study, we shall consider the issues related to modeling education and its components as corresponding systems, determining those essential objects and relationships

between them that significantly affect the nature of the educational process and the properties of the final product of the education system, that is, those that initially affect the quality of education of the individual in more detail.

We shall include some definitions on which further consideration is based (*Bykov, 2008: 2, 286-291*). The education system is a complete system of objects (elements) and relations (relationships) between them, separated from the society on the basis of belonging to the selected objects and relations to the implementation of educational goals (*Bykov, 2019: 3*). As part of this approach, we have worked out some of the regulatory requirements for the acquisition of knowledge, prescribed in the educational program, which are fixed in the curriculum, what the student should know and should be able to do from a particular subject. Taking into account the student's knowledge in the requirements, criteria evaluation in modern schools in a number of provisions to control the activities of the student, the student, the cadet, etc., and the activities of the teacher of education institutions are developed.

The main goal to be achieved when implementing an innovative educational model is the possession of the latest scientific information, which is determined in the content and volume of printed sheets. For the same purpose, the technology of knowledge acquisition is used, which is based on the creation of the concept of education as an information process that ends in the perception, preservation, reproduction and editing of scientific information (*Bykov, 2019: 3*).

In modern practice, the educational process is implemented in an educational institution:

- due to the constant improvement of information, reformation of the content of knowledge, restructuring, by agreeing on various topics and concepts;

- by updating the logic of requirements and organizing educational material in accordance with scientific methods of cognition (induction, deduction, systematization, modeling, etc.).

The criteria for evaluating the activity of knowledge arise as a result of educational structural processes obtained in practice.

Working out the content of education and checking the effectiveness of its assimilation is realized only by determining the rate between the set (beginning) and the received (result): as a result of assimilation of planning and knowledge structure. Therefore, pedagogical interactions are implemented more successfully, with preliminary planning of the result.

Difficulties that arise in the process of learning arise mainly due to changes in the content of knowledge (or its reconstruction on the basis of intersubject links). Thus, the activity of recognition is considered as a type of dynamics in the knowledge system, and this is evaluated according to a linear scheme: before training, the student does not know, does not understand, does not use, etc.; after education, he knows, can do, understands. The process of acquiring knowledge is not analyzed in this model (*Bykov, 2008: 1*).

All our arguments about the existing information model for training students in higher education institutions mean that the development of optimal technology involves not only the choice of scientific knowledge that is subject to assimilation in a certain system, but also the content in the educational experience of students, which may have different sources of information. Without this the transition to the material, even the right logic built will be formal for the students, and does not affect the quality of the individual, does not show a rich subjective experience, considering, as appropriate, their practical activities, cannot make abstraction of the phenomena associated with the personal self, with the formation and development of «specific» a person's ability to be relatively independent subject of his own actions, assures him the opportunity to be free and conscious subject of his own activity.

After the theory, formulated by L. Vygotsky, which reads «education leads to development», an intense theoretical activity programs that will be experimentally proven begins, it is the mechanisms of formation of subjective activity, self-sufficiency, initiative that was considered in the past as interiorization of social effects, which are guided by the lecturer.

Interiorization (from lat. *interior* – internal) is a psychological concept that means the formation of mental actions and the internal plan of consciousness through the individual's assimilation of external actions with objects and social forms of communication (*Bykov, 2008: 1*). This concept was introduced by French psychologists Pierre Janet, Jean Piaget, Henri Wallon and is used in psychoanalysis to explain the transition of the structure of multi-individual relationships inside the psyche and the formation of the unconscious (individual or collective), which in its turn determines the inner plan of consciousness. According to Vygotsky, interiorization is the formation of the human form of the psyche due to the development of human values by an individual (*Wikipedia, 4*).

Interiorization (eng. *interiorisation* – appropriation of values, their growing into a person. The process of forming internal structures of the psyche. The process of transition from external (real) to internal (ideal) actions-mental acts (*Wikipedia, 4*).

During interiorization, the intensive activities of theoretical programs, as a result, become internal, that is, subjective, personal new formations. This activity of the student is considered as completely imposed from the outside and is determined by the content of education. The education of students in higher education institutions is still directed not to the mechanism of self-development of a person, but to the final product – a developed, already «trained» personality.

Institutions of higher education, in modern conditions, offer society «ready», «educated» specialists who will work in the future in already artificially created conditions. The implementation of the existing model of training specialists does not form a mechanism of self-activity in accordance with its psychological «nature», does not create any conditions for choosing a way and ways to achieve some goals, intentions, and needs, and they are always weighty and individual for each person.

Educational methods in current institutions of higher education do not help students to show self-sufficiency, which is expressed in self-organization, self-realization and self-esteem. Instead of managing the attention to the process that affects the individual in the development of mental activity, the result of education is expected only in the end – the assessment of compliance with the already «developed» person imposed to social and professional standards.

A strong determinism of personality development is characterized by educational influence obtained as a result of his knowledge; activity also begins to be considered as a derivative of this influence, and adaptation to the social environment and adaptation to it, by fulfilling its laws and requirements. In addition, the main attention is paid to the creation of adaptive forms of knowledge activity, which corresponds, in general, to the call for full influence on a person, his formation as a performer and this helps to establish uniform forms of consciousness and behavior in the educational process (*Bykov, 2008: 1*).

The educational programs developed after this base for different subjects reproduce only such a mechanism of interiorization (internal to external interiorization), which also leads to a misconception about the definition of conditions for the formation of psychological processes, and control of psychological development. We believe that this is not accidental, because it is very important to pay attention to inserted, programmable education, which is designed to provide the best possible condition for the adaptation of each student, student, cadet, to the educational impact, by logical development of a «correction scheme» of causes and actions, as a normative model of assimilation (*Bykov,*

2008: 1). Note that students are still, to a certain extent, performers of imposed programs, and «imitation» actions of the teacher, as «super-educated machines».

On this basis, normative models based on logical laws have been developed and built, these educational programs, which guarantee their algorithms, rules, instructions, schemes, examples, and so on, create the same learning conditions for all students. It is important that if there were distractions in the training result in these conditions, the logic of the program development changed to a stronger one-sided meaning of strict requirements.

The complex mechanism of interaction between logically existing and personally significant logical models in interiorization, proposed as the «orientation base for action» is the same for each student. This mechanism of knowledge formation, activity and self-sufficiency, guarantees that students acquire only those knowledge, skills and abilities that produce a specialist performer, reproducing established logical models.

The analysis of the modern information model of students' education in higher education institutions, despite all its positive aspects, has, of course, some disadvantages and limitations (*Bykov, 2008: 1*). They could be successful, and win with the help of a new digitalization technology that requires a new model of education - digitalization, more modern, implemented in the conditions of digitalization, different from information.

Digitalization (from english *digitalization*) is the introduction of digital technologies in all spheres of life: from interaction between people to industrial production, from household items to children's toys, clothing, and so on. This is the transition of biological and physical systems to cyberbiological and cyberphysical systems (combining physical and computational components). Transition of activity from the real world to the virtual world (online).

Digital technologies: the Internet of things, robotization and cybersystems, artificial intelligence, big data, paperless technologies, additive technologies (3D printing), cloud and cloud computing, unmanned and mobile technologies, biometric, quantum technologies, identification technologies, blockchain and so on. Consumers of digital technologies are all - the state, business, and citizens (*Strategy Ukraine 2030E, 8*).

The modern educational model in higher education institutions should provide a comprehensive use of traditional, computer-based and innovative methods, tools and their inherent organizational innovative forms of work. All of the above should be built taking into account not only the requirements for students, students, cadets and taking into account the subjective experience of teachers.

Teachers – as a significant factor in the process of digitalization of education

Changes in society, an increase in the flow of diverse information, a large number of sources used, necessarily lead to changes in the knowledge and skills that a student must acquire as a result of the educational process in higher education institutions, that is, the role of the teacher becomes more complex and new knowledge and skills are required from him.

The teacher becomes a moderator and coordinator of educational hours in higher education institutions, his dominant role in the audience is being reformed and transformed, he constantly develops and respects the thinking of others and creates a comfortable atmosphere for working in higher education institutions. In this case, the teacher is the arbiter between the educational process, students, computer and technology. In addition, he should be both a leader and an example for students, organize information and direct students' activities through feedback. All this requires significant changes in the system of teacher training: constant self-improvement, adaptation to changes in the conditions of digitalization that occur in the dynamic open educational environment of higher educational institutions (*Bykov, 2008: 1*).

The computer, in all its own forms of definition, requires progressive teachers and specialists in the field of education, so-called «agents of change» that can lead to qualitative

changes in education. One of the reasons why progressive education sometimes fails to introduce changes is that they lack the tools to create new systematic and reliable methods. The role of the teacher in the educational process will change with changes in the age of students to achieve the highest level of competence (*Smirnova, 2015: 6*). For example, it is obvious that for small age groups in general education institutions, for most tasks, modern methods of distance learning are impractical, but on the contrary, for higher education institutions or vocational education, this form of training is relevant.

The tasks that in the new conditions of digitalization of education which are dictated to the teacher are to determine the optimal type of media for the outline plan, and to select specific educational didactic multimedia materials that are suitable for the needs and characteristics of students (*Strategy Ukraine 2030E, 8*). If the teacher cannot find the appropriate training material, then the media for presentation can be changed with their own hands what has already been developed. Borrowing can be both a challenge and a chance to demonstrate creativity in the work of the teacher. in terms of time – consuming, it is more effective than creating your own materials, however, in certain cases, a good solution for a specific learning situation, teachers create training materials themselves.

Basically, for the implementation of practical programs, computers with the appropriate software can help, the bottom line is that most often teachers do not develop computer software because they are not ready for it yet. Nevertheless, software packages can be used for commercial purposes, which can create a lot of high-quality educational materials without the necessary professional knowledge in the field of programming, focusing on the methodological foundations of developing electronic educational resources as content of the information and educational environment (*Smirnova, 2015: 6*).

It is enough, first of all, that teachers were well-known with the capabilities of computers, and knew how to use them. Teachers can use software packages very effectively when preparing multimedia teaching materials. In any case, the most viable educational tool is a multimedia computer that includes all other media (*Bykov, 2008: 1*).

Control over the learning process should be simple, because students may be concerned in a loaded integrated multimedia environment, because of this, those teachers who are responsible for monitoring the process are constantly updating and editing questions for self-monitoring and certification.

In the early history of the introduction of computers in education, many teachers noted the question «Can a computer replace a teacher?». Over time, when teachers recognized all the possibilities and limitations of computer technology, this concern disappeared. In the modern world, there is a new question that appears and is relevant: «How can a computer, as a means for learning, best expand the capabilities of teachers» (*Smirnova, 2015: 6*).

Our research confirms that most of the teachers are free to use the computer in their own experience, but did not use new modern technologies and methods in educational processes, the increase in the frequency of computer use, creates the need for training and assistance to teachers, more actively use the computer in training, in the classroom, when conducting integrated lessons, on simulators, and other multimedia learning tools.

Teachers often implement the application of information technology (IT) in a separate course, without integrating technology into other subjects that are studied during the training period. However, for thorough integration of new technologies into educational programs for training specialists, teachers must have their own high experience in using information technologies (*Smirnova, 2015: 6*).

In order to use computers as part of the newest technological equipment in order to change and improve the quality of their work in the classroom, the teachers themselves must have accumulated experience in using and learning with computers and multimedia simulators. Modern teachers should teach in an open educational environment, with the help

of knowledge on the subject of «Information technology». Teacher training is a natural starting point for the important process of integrating information technology into modern education in the state (*Bykov, 2008: 1*).

It is not easy to introduce new educational technologies in the context of universal digitalization. Making changes to the content of teaching (what students learn) and updating the forms and methods of teaching (how teachers teach) is a difficult task of modern education. These changes cannot simply be approved by legislation. Implementation of such changes was proposed more than 20 years ago in National Informatization programs, but only some of them have been implemented. General principles the place and role of the state, the principles of implementation of state policy in the sphere of Informatization of Ukraine was defined in the laws of Ukraine «On information» (1992), «On the Concept of the National program of Informatization» and «On National program of Informatization» (1998), which were considered the backbone of the national information legislation (*Gurzhy, 2007: 5*).

Many of the proposed pilot experiments were successful, but some institutions returned to traditional models. Often, for example, the reason for the failure was that the interaction of technologies and techniques were critically absent for the successful implementation of the proposed information model of training. But the most important factor for rejecting the information model of education was the lack of skills and motivation of teachers of educational institutions to implement changes (*Smirnova, 2016: 7*).

In the implementation of new models of learning is most often done in a combination of almost all methods of training. The teacher teaches with a presentation, demonstrates how to type some commands, using exercises students learn skills, group problem solving, integrated learning, discussions of goals and ideas, and at the stage of independent learning on the computer – the role of the tutors is activated. In fact, the goal of modern innovative education is a flexible system that will adapt to the educational situation and at every moment the teacher can choose the most suitable method of teaching, especially in the conditions of universal digitalization.

If the use of information technologies is designed in advance, then these technologies have a great potential for ensuring the learning process, but provided that the most important principle of student-centrism is implemented. From materials that can be found in the Internet, such as professional journals, it is clear that many elements of learning are presented using modern technology, combined with new structures, graphs, multimedia resources to ensure active learning in the context of digitalization, to develop e-learning resources as content of the information educational environment (*Smirnov, 2015: 6).

In education, at present, examples of interdisciplinary projects in higher education institutions, within the framework of regional and all-Ukrainian levels of experiments, for the development of problem-solving skills and critical thinking of students are given. As a rule, positive results are achieved most often when using IT tools, in addition to changing the role of students in the learning process, computer technologies have the potential to change the role of the teacher in the audience, and in the educational process in general.

In the course of the research, we found out three main aspects of changes in the conditions of digitalization of the educational process:

- teachers have great opportunities for individualizing training in the updated content of the educational process;
- students are relieved when using IT, and expect teachers to be able to teach integrated, comprehensive academic content of disciplines;
- institutions of higher education are radically changing the concept of educational institution management, while integrating general digitalization into education, where the role of both the teacher and the student is changing.

Note that teachers who use a computer spend much more time and effort in organizing training in the classroom, but their efforts give more positive results. In the study of the use of telecommunications in higher education institutions, we noticed similar facts about the use of telecommunications in education. Teachers who used telecommunications sought to give students more independent work, based on projects, and less time found for classical learning (*Smirnova, 2016: 7*). Moreover, computers can help teachers overcome the isolation of an individual teacher from the restrictions in the classroom. According to our findings, telecommunications technologies provide the teacher with individual means of communication and communication with experts and colleagues to find out facts from research abroad, and to discuss well-developed training materials on disciplines, to receive and provide examples of the true implementation of their own knowledge and capabilities (*Smirnova, 2015: 6*).

Higher education institutions are equipped with telecommunications networks and provide opportunities to be «institutions without walls», where education can continue even after the bells ring. Teachers who own computers at home and at work, and have access to resources in the school and outside of it, can create, save, view, and export their work to all interested parties from other regions and countries. Modern development of distance education systems, which are in expansion, shows that all of the above is true (*Bykov, 2008: 1*). In the new model of learning in the conditions of digitalization, it is clearly visible that there are changes in the role of the teacher and the student. Of great importance is the fact that these roles change within the hour. A teacher for an academic hour and a classical teacher who leads classes, and this is a coordinator who changes the learning process, using IT and multimedia simulators. A student is both a receiver of information and an active participant in the learning process. IT tools receive positive characteristics from both the classical methodology and the newly developed one (*Smirnova, 2016: 7*).

Thus, new approaches to the use of computers in the classroom require special attention in the preparation of the teacher, in order to use them appropriately new principles of educational activity. Almost 20 years ago, foreign scientist Mills called this problem liveware, in his opinion, and we believe that a person using computers is part of the «hardware-software-liveware» system.

In the first wave of IT and computer use in education, it was emphasized that the state provided the equipment for educational institutions, and then the educational institutions realized the problem and began to receive software willingly. The next task was to find enough time and money, and accordingly, the attention of each individual was part of the human factor (liveware), that is, teachers, as carriers of knowledge and computer use, expanded and improved education (*Gurzhiy, 2007: 5*).

Models of education in educational institutions, on the basis of which new computer educational programs were created, were unknown for many teachers of higher educational institutions. These models were based on the assumptions of cognitive psychology, but many teachers mentored models based on elements of behavioral psychology. In the new computer programs, the emphasis was placed on the learning process – mainly learning understanding and active inclusion of the student in the process of learning the educational material. In new open computer learning environments, students gain knowledge through experiments in educational activities, and because of this, the student is seen as an active participant in the process of creating information concepts, which is the basis of the General digitalization of the state (*Bykov, 2008: 1*).

We emphasize that neither the training experience nor the professional training of the majority of teachers is sufficient to change the model of education in higher education institutions. Teachers do not have enough theoretical and practical tools to be able to use successfully and integrate new media applications on their computers because of this,

further self-study teachers to work with computers, must include the following types of practical work with relevant multimedia apps to use your most successful experience in education, to update the model of education in institutions of higher education. Teachers are one of the main factors that influence the implementation of a successful learning process (*Smirnova, 2016: 7*).

Before starting the process of changing the model of education - digitalization of the educational process in higher education institutions, the starting point should be-to determine the characteristics of the human factor – teachers. For these reasons, we conducted a survey among teachers of the Izmail State University for the Humanities (ISUH) to determine their readiness to adopt new digital technologies, to activate educational processes in classrooms with students, and to confirm the knowledge and skills they already possess in the IT industry as factors for more successful implementation of the educational process.

The study involved 48 teachers from three departments of the faculty of management, administration and information activities of ISUH of different ages and different backgrounds.

The experiment shows that, although 81.2% of teachers are fluent in computers and have them at home (mostly younger 25-35 years old), only 27.4% regularly use them for the needs of their profession, and only 30.6% of teachers assess their computer literacy as a sufficient level. Only 18.2% said that they needed additional training or courses to improve computer literacy, in order to activate working with a computer in the field of professional activity. On the other hand, 91.2% of teachers believe that computers provide a huge opportunity and effective ways to facilitate their work in certain activities in the educational process, but this is still a big problem for them.

The percentage of teachers who are ready to use immediately a computer in their classrooms is 60.9%, and 38.1% will do this only if they are provided with special training on digitalization.

Based on the results of the survey, as well as based on teachers ' own opinions, their knowledge and skills of working with a computer, and other modern information technologies, we can state that special training of teachers is required for working on a computer, for the possibility of acquiring competencies according to educational programs in which information technologies and computers are a necessary element, which are included as an integral part in the conditions of digitalization.

All the results of the survey demonstrate that young teachers are better prepared for educational activities when using IT tools, including modern technologies and computers, and the basics of developing electronic educational resources as content of the information and educational environment.

The results of the experimental study state that:

- The majority of young teachers are fluent in computers at home – 77.9% compared to respected teachers (45-55 years old) (22.1%).

- Despite the fact that they work in the same conditions, 43.3% of respected teachers believe that they do not have the opportunity to work with a computer in the workplace, while the younger ones have this figure of 18.9%. This shows that young teachers are more interested and willing to update the technical park and general technical equipment in higher education institutions.

60% from respectable teachers, do not use computers in their profession in the classroom at all, while the young people had this figure of 32.6%.

- 13.3% of respected teachers do not use a computer outside of the education institution, note that there are also young teachers, 4.2% – who do not use a computer, multimedia simulators, or any other educational tools at all.

- All teachers rated their own literacy, computer work more than or equal to 4 (in steps from 1 to 5), they evaluated only their own judgments, this percentage is 87.9%.

- Despite the fact that computer skills are higher among younger teachers, the percentage of young teachers who responded that they feel the need for further training to work with computers is also higher – 84.2% than the percentage of respected teachers compared to 63.3%.

- A high percentage of young teachers who directly answered that they were trained to use computers and want changes in their professional activities in the conditions of digitalization, with or without further training is 84.2%, against 60% of respected teachers.

Based on our experimental study presented above, we understand that the teachers of the faculty of management, administration and information activities of the Izmail State University for the Humanities absolutely agree:

- for inclusion of modern information educational technologies and computers in the educational process;

- for changes in the means of educational activity of students;

- for changes in the management and administration of an educational institution;

- for changes in the model of education in the educational institution, in the conditions of general digitalization of our state.

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