Innovative Technologies in Higher School Practice

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Summary

Educational innovations are first created, improved or applied educational, didactic, educative, and managerial systems and their components that significantly improve the results of educational activities. The development of pedagogical technology in the global educational space is conventionally divided into three stages. The role of innovative technologies in Higher School practice is substantiated. Factors of effectiveness of the educational process are highlighted. Technology is defined as a phenomenon and its importance is emphasized, it is indicated that it is a component of human history, a form of expression of intelligence focused on solving important problems of being, a synthesis of the mind and human abilities. The most frequently used technologies in practice are classified. Among the priority educational innovations in higher education institutions, the following are highlighted. Introduction of modular training and a rating system for knowledge control (credit-modular system) into the educational process; distance learning system; computerization of libraries using electronic catalog programs and the creation of a fund of electronic educational and methodological materials; electronic system for managing the activities of an educational institution and the educational process.

In the educational process, various innovative pedagogical methods are successfully used, the basis of which is interactivity and maximum proximity to the real professional activity of the future specialist. There are simulation technologies (game and discussion forms of organization); technology "case method" (maximum proximity to reality); video training methodology (maximum proximity to reality); computer modeling; interactive technologies; technologies of collective and group training; situational modeling technologies; technologies for working out discussion issues; project technology; Information Technologies; technologies of differentiated training; text-centric training technology and others.

Keywords:

innovative technologies, Higher School, factors of effectiveness of the educational process, classification of technologies, pedagogical methods, computer modeling; interactive technologies; technologies of collective and group learning; technologies of situational modeling; technologies of working out discussion issues; project technology; Information Technologies; technologies of differentiated learning.

1. Introduction

Integration into the world community actualizes the problem of readiness of society and individuals for changes in all spheres of life: social, economic, scientific, political, technical and technological. The priority task of higher professional education is the development of such qualities and abilities in the future specialist that would allow him to successfully adapt to rapidly changing competitive conditions, readily perceive and implement innovations, and create a qualitatively new social space. Therefore, a characteristic trend of modern education is innovation, which determines its openness to new, advanced character in relation to other branches of human activity [9].

The purpose of the article is to substantiate the role of innovative technologies in Higher School practice.

2. Analysis of recent research and publications

O. Voloshina describes the organization of innovative activities of Higher School Teachers, their introduction of innovative teaching methods and technologies [9].

I. Kozachenko defines technology as a phenomenon and emphasizes its importance, notes that it is a component of human history, a form of expression of intelligence focused on solving important problems of being, a synthesis of the mind and human abilities [5].

R. Gurevich believes that a characteristic trend in the development of modern pedagogical technology is the use of system analysis in solving practical issues related to the creation and use of educational equipment and technological learning tools. [3].

Many authors Kotiash, I., Shevchuk, I., Borysonok, M., Matviienko, I., Popov, M., Terekhov, V., Kuchai O., Shunkov, V., Shevtsova, O., Koval, V., Grygorenko, T., Yefymenko, L., Smolianko, Y., Skyba, K., Demchenko, A., Savchenko, N, Necheporuk, Y., & Rezvan, O. and others findings that the practice of multimedia technologies in the educational process of higher education institutions lets to move from a passive to an active way of realizing educational activities, in which the student becomes the main participant in the learning process. Also regards the educational objects of multimedia learning technologies and study the fragment of multimedia education in the progress of the information culture. [4; 6; 8].

I. Artemov, I. Studenyak, I. Golovach, A. Gus argue that educational innovations are the first created, improved or applied educational, didactic, educative, managerial systems, their components that significantly improve the results of educational activities [1].

3. Research methods

To solve the problems, theoretical methods were used: analysis of philosophical, psychological, pedagogical, educational and methodological sources, textbooks, state regulatory framework that determine the structure and content of innovative technologies in higher education; content analysis of basic research concepts; analysis, synthesis, comparison, generalization and systematization of scientific, theoretical and practical provisions for the formulation of conclusions.

4. Results and discussion

The term "pedagogical technology" appeared in education relatively recently. As for the educational process, the American James Sully adopted it in 1886. However, the discussion about whether pedagogical technology exists in nature as a certain tool of teaching and educating that every teacher can master continues to this day.

I. Kozachenko believes that modern pedagogical technology covers a range of theoretical and practical issues of leadership, organization of the educational process, methods and means of teaching. It owes its origin to the implementation of pad technical ideas expressed at the turn of the XX century by the founders of pragmatic psychology and pedagogy, representatives of "industrial pedagogy". The scientific and technological revolution, which has affected all branches of science, public life, and education, fills pedagogy with new content.

The history of the formation of pedagogical technology to a certain extent reproduces the following scheme: the idea to introduce an engineering approach; technical means in the educational process; algorithmization of learning; programmed learning; technological approach; pedagogical technology (didactic aspect); behavioral technology (aspect of Education).

Not all components of pedagogical technology have received the same development. Especially difficult is the creation of educational technology, although this industry also has significant developments in the process of formation and functioning of pedagogical technologies, where certain trends and patterns can be traced. First, objective and subjective prerequisites are needed. For example, pedagogical technologies based on the ideas of the "School of Dialogue of Cultures" and "Probabilistic Pedagogy" could only be established as a result of the crisis of pedagogical technology developed on the ideas of "developmental learning".

In general, technology as a phenomenon is an important component of human history, a form of expression of intelligence focused on solving important problems of being, synthesizing the mind and abilities of a person.

The development of pedagogical technology in the global educational space can be divided into three stages.

The first stage (1920s-1960s) was due to the beginning of improving the quality of teaching, which was considered as the only way to lead to effective learning. Attempts were made to improve the effectiveness of teaching by raising the information level of training when using mass media.

The second stage (1960-2000-ies) was characterized by a shift in emphasis on the learning process, which is associated with the development of the concept of programmed learning, which required strict consideration of age and individual differences of students. Attention to the learning process has led to the realization that it determines the teaching methodology and is the criterion for success in general. If before 1960 textbooks were intended for teaching a group of students, then since 1960 individualization of learning has become the central point of planning and producing learning tools. As a means of individualizing learning, the curriculum in these projects was divided into portions, for which instructions were developed, didactic material, audiovisual and other teaching tools were selected. These portions were named "modules", "training units", and "training packages".

The third stage, the modern one, which begins in 2001, is characterized by the expansion of the sphere of pedagogical technology. If earlier its functions were actually reduced to servicing the learning process, now pedagogical technology claims to play a leading role in planning, organizing the learning process, and developing methods and teaching tools. Learning tools include documents, material objects, and people whose interaction leads to the acquisition of knowledge. Learning tools are

divided into learning tools that are professionally designed for learning and environmental objects. The procedure for studying the possibilities of learning tools usually coincides with the invention of another technological novelty. The exception is programmable learning, the ideas of which were expressed back in the 30s, and their implementation became possible only in the early 50s of the XX century. The development of a technological approach in domestic education has slightly different time limits. A characteristic trend in the development of modern pedagogical technology is the use of system analysis in solving practical issues related to the creation and use of educational equipment and technological training tools. The main criterion for system analysis at all levels (from planning educational tools to implementing them in the learning process) is generally the optimality criterion. The use of system analysis in the creation and use of learning tools is certainly positive and promising. Careful planning of the activities of the teacher (professor) and pupils (students) makes predicting learning outcomes more reasonable.

All the features of the system characterize pedagogical technology: the logic of the process, the interrelation of parts, structural and semantic integrity, natural feasibility, and the intensity of all processes.

Scientists dissatisfied with the church school's disregard for new knowledge in the XII century began to unite in non - church unions, initiated the creation of higher special schools – universities – communities of those who teach and who study, open to all comers. The first universities were opened in Bologna (1158), Oxford (1168), Cambridge (1209) and other European cities. The university management system, which enjoyed a certain autonomy in relation to the church and city magistrates, had elements of democracy: elective leadership positions (rector, student council), self-government.

The main types of classes at the University were lectures (reading a certain canonical book and comments on it) and debates (disputes about certain theses that had to be proved or refuted with the help of logically formal argument skills or tricks). Students performed many exercises and wrote written works – treatises. The language of instruction was universal – Latin, which contributed to the rapprochement of students from different countries, made it possible for them to move from one university to another in order to expand their knowledge. In the XII century, there was a type of traveling student.

The uneven cultural and economic development of the leading European countries led to the emergence of new features in education and schooling, designed by the needs of a new, economically powerful class – the bourgeoisie. The final disintegration of feudal relations and the development of capitalist production led to the struggle of the bourgeoisie against the privileges of the nobility and clergy, which took place under the slogans of improving society, against prejudice and ignorance. In this confrontation, great importance was attached to education, which was considered as a great political force. It is no coincidence that it is at this time that teachers act as prominent political and public figures.

In the XVII century in England, as well as in XVIII – in France and Germany, prominent enlighteners oppose the existing formalism in the field of thought and beliefs, against church and state absolutism with its abuses and tyranny in the field of morality, governance, and thought. The human mind becomes the main means of achieving human happiness. There is a deep belief in the rights of the individual, first of all to individual assessments, the solution of any issue, freedom of thought, conscience, and self-sufficiency of the human mind.

The main criterion of any real education is its practical usefulness, independent thinking, the ability to prove and generalize. Representatives of the French Enlightenment Philosophy of the XV century (Voltaire, Helvetius, Holbach, Lametri, etc.) waged a tireless struggle against ecclesiastical and feudal backward ideology, were people of encyclopedic knowledge, emphasized the need for Natural Science Knowledge – a strong weapon against ignorance, religious fanaticism, the dominance of dogmatism and scholasticism. Giving a decisive role in the creation of new (bourgeois) social relations to the beliefs of people and their education, the enlighteners emphasized the problems of human formation. The deeply developed philosophical and pedagogical systems of this era are interrelated and complement each other.

The emergence of educational reform trends in the late XIX – early XX centuries in Europe is due to the desire of teachers to build a new school on the theoretical basis of classical teachers, which would educate initiative, comprehensively developed people who can become entrepreneurs in the future, active figures in various sectors of state and public life.

In the 70s and 80s of the XX century, the attention of the pedagogical community was attracted by the concept of the "Authorial School", which is based on new creative principles of organizing education and training. The Authorial School must have an author who is a leader in the implementation of the idea, stability and sustainability of results, and most importantly – the synthesis of a worldview concept with technological support.

As noted, the concept of Authorial School is not used in foreign psychological and pedagogical literature. Such concepts as "Effective School", "Alternative School", "Magnet School", and "Focus School" are used. These names indicate that the authors use not outdated concepts, but those that are not only inferior in level of emotionality to the "Authorial School", but sometimes exceed it.

In our opinion, the term "Effective School" is closest to the concept of "Authorial School". This concept has many variants in Western literature. For example, the following efficiency factors are distinguished::

– focus on learning and achieving high learning outcomes;

– high level of expectations;

– unity of teachers' opinions regarding the entire school;

– unified line of behavior of students;

– ensuring clear operation of each class;

– frequent encouragement and praise;

– distribution of responsibilities among the majority of students;

– favorable environment;

– an open demonstration of caring for each student.

After comparing the factors listed by the researchers, formulated in sufficient detail, we notice that they are consonant with the characteristics of the Authorial School. First of all, attention is drawn to the focus on high performance, a favorable environment and the dedication of teachers to the common goal of teachers, students, and schools.

At that time, there were such Ukrainian Authorial School: Sakhnivska School-toloka O. Zakharenko; School of Dialogue of Cultures V. Bilber; Authorial Experimental School "Millennium"; Authorial School N. Gontarovskaya and others. In England, the so-called first effective new schools are being opened: Cecily Reddy in Abbotshall and Dr. Bedley's school in Petersfield (1893) [5].

At the end of the XX century, there are processes of understanding the accumulated experience of humanity. Base on the formation of new approaches to the meaning of being, the very way of life as a creative self-realization of each individual, creative development and the existence of society as a whole, in which innovation is one of the most important signs of any activity, education, phenomenon, etc.

Therefore, it is quite natural to adopt relevant regulatory acts at the state level, for example, Ukraine has adopted Laws "On Innovation Activity" and "On Priority Areas of Innovation Activity in Ukraine", which define the mechanisms for introducing innovation activity in society and orient it to innovative development. There are creating the necessary (legal, economic and organizational) conditions for updating, further development and use of the country's scientific and technical potential, reviving spirituality, intelligence of the state, forming an innovative culture of the nation, etc. [7].

A characteristic trend in the development of modern pedagogical technology is the use of system analysis in solving practical issues related to the creation and use of educational equipment and technological training tools. The main criterion for system analysis at all levels (from planning educational tools to implementing them in the learning process) is generally the optimality criterion.

The use of system analysis in the creation and use of learning tools is certainly positive and promising. Careful planning of teacher and student activities makes predicting learning outcomes more reasonable.

In connection with the modernization of higher education in the system of training future specialists, there are drastic changes in the selection of organizational forms and effective methods aimed at social partnership between teachers and students, as well as between all those who are interested in the field of education - graduates of higher education institutions, employers, local self-government bodies, public organizations. All this, as R. Gurevich emphasizes, is the goal of deep integration of higher education institutions into the surrounding socio-economic environment, making their activities more dynamic and adaptable [3].

Currently known pedagogical technologies, which are most often used in practice, can be classified as follows.

Structural and logical Technologies: a step-by-step organization of the learning system that provides a logical sequence of setting and solving didactic problems based on the selection of their content, forms, methods and means of teaching at each stage, taking into account the step-by-step diagnosis of results.

Integration technologies: didactic systems that ensure the integration of intersubjective knowledge and skills, various types of activities at the level of integrated courses, training topics, lessons, and training days.

Game technologies: didactic systems of using various games, during which the ability to solve problems based on compromise choice is formed (theatrical, business games, simulation exercises, individual training; solving practical situations and problems, computer programs, etc.).

Training Technologies: a system of activities for working out certain algorithms for solving typical practical problems, using a computer (psychological trainings for intellectual development, communication, solving managerial problems).

Information and computer technologies: these are technologies implemented in didactic systems of computer training based on the human-machine dialogue through various training programs (training, monitoring, information, etc.).

Dialogic Technologies: a set of forms and methods of teaching based on dialogic thinking in interacting didactic systems of the subject-subject level: (student-teacher, student-author, teacher-author, etc.). Dialog forms are considered the most common among other modern technologies.

The peculiarity of modern education is that in practice, various technologies can be actively and very effectively combined.

The interest in innovations of the world pedagogical community is manifested in the creation of Information Services (the Center for research of innovations in education under the auspices of UNESCO, the Asian Center for pedagogical innovations for the development of education). The beginning of programs for the introduction of pedagogical innovations, holding international

conferences, the activities of organizations that generalize pedagogical innovations in different countries of the world, inform the pedagogical community about them on the pages of special magazines. In particular, the International Bureau of Education (France, Paris) publishes such periodicals as "Pedagogical Inovations", "Information and Innovation in Education", etc. [5].

Therefore, the historical analysis of the problem of using innovative pedagogical technologies in the practice of Higher Education shows that the socio-theoretical foundations and development of pedagogical technology in the world educational space were formed under the influence of humanistic ideas of advanced thinkers of different eras and included three stages. Every year, attempts were made to improve the effectiveness of teaching by raising the information level when using mass media, audiovisual teaching methods, manuals, and didactic material. Over time, pedagogical technology claims to play a leading role in planning and organizing the learning process and combines the logic of the process, the relationship of parts, the structural and content integrity and intensity of all processes.

The term "innovation" comes from the Latin word – to change, update, invent and means the introduction of a new one. In modern scientific literature, innovations are considered as completely as new forms of Labor Organization and management, new types of technologies that cover not only various institutions and organizations, but also certain areas of social life of people.

Historical sources of educational innovations are connected with the period of the origin of experimental pedagogy in the second half of the XIX century. Since the 60s of the last century, the phenomenon of "innovativeness" has become a key feature of the post – industrial formation – its formation and development.

The question of innovative educational activity has the starting point of defining the content of the terms "Innovation", "Innovation Project", "Innovative Culture", "Educational Innovations", and «Innovative Educational Activity", which allows us to establish the essential features of the flow of innovative processes in the education system. Thus, it can be assumed that educational innovations are first created, improved or applied educational, didactic, educative, managerial systems, their components that significantly improve the results of educational activities.

Therefore, innovation should be considered as an implemented innovation in education – in the content, methods, techniques and forms of educational activities and personal education (methods, technologies). In the content and forms of organization of management of the educational system, as well as in the organizational structure of educational institutions, in the means of training and education and in approaches to social services in education, which significantly improves the quality,

efficiency and effectiveness of the educational process, which goes through various stages. There are:
– identifying change needs (identifying a problem);
– developing an idea for solving a problem;
– developing a way to solve the problem (innovation);
– approbation and expertise of the innovation;
– mastering an innovation;
– institutionalization of innovations.

The innovation process begins with identifying the need for changes in certain areas of the educational process in higher education, which occurs due to the analytical work of specialized scientific organizations, educational management bodies, and university leaders, scientific and pedagogical teams.

Scientists view innovation in education as:
– the process of creating, distributing and using new tools (innovations) to solve those pedagogical problems that have been solved differently so far;
– the result of creative search for original non-standard solutions for various pedagogical problems;
– actual, significant and systemic neoplasms that arise on the basis of various initiatives and innovations that become promising in the context of the evolution of education and have a positive impact on its development;
– products of innovative educational activities that are characterized by the processes of creating and using a new tool (innovation) in the field of pedagogy and scientific research;
– various innovations in the activities of educational institutions, in the implementation of the educational process.

Among the priority educational innovations in higher education institutions, the following attract attention:
– introduction of modular training and a rating system for knowledge control (credit-modular system) into the educational process;
– distance learning system;
– computerization of libraries using electronic catalog programs and creation of a fund of electronic educational and methodological materials;
– electronic system for managing the activities of an educational institution and the educational process.

The educational process successfully uses a variety of innovative pedagogical methods, which are based on interactivity and maximum proximity to the real professional activity of the future specialist, including:
– simulation technologies (game and discussion forms of organization);
– case method technology (maximum proximity to reality);
– video training method (maximum proximity to reality);
– computer modeling;
– interactive technologies;

- technologies of collective and group training;
- situational modeling technologies;
- technologies for working out discussion issues;
- project technology;
- information technology;
- differentiated learning technologies;
- text-centric learning technology and others.

A number of innovative forms of organizing the educational process, teaching technologies are inextricably linked with the creation of innovative tools for creative activity of students and teachers in a higher educational institution, that is, material and technical support. Computer classes with internet access are of priority importance, since the use of computers in teaching, research, control and self-control is extremely necessary in the context of intensive innovative learning technologies.

The basis of innovative activity of a modern teacher is the formation of an innovative program methodological complex in the discipline. Along with the software and content support of disciplines, the use of information tools and their didactic property comes first.

This involves visual and figurative presentation of information, creating a video library for illustrating information material: lecture notes, electronic lecture notes, which allow you to combine slide shows of text and graphic accompaniment (photographs, diagrams, drawings) with computer animation of text, showing documentary recordings. It combines technical capabilities – computer and video technology with live communication of the lecturer with the audience.

The paradigm of innovative development of Higher Education provides for such a way of organizing the activities of a higher educational institution, which ensures the achievement of the goals and objectives of its innovative development.

The key element of this paradigm remains knowledge, as for the traditional paradigm, but the main difference is that if the previous approach found out the way knowledge is transmitted, then the new approach focuses on the way it is produced. An innovative higher education institution requires new approaches in both the management and organization of the educational process.

In April 2004, an international conference on research and innovation at universities was held in Liege (Belgium) under the auspices of the European Commission. About 1,000 participants – employees and leaders of academic organizations, industrial companies, politicians and representatives of government circles in Europe, the United States, Australia, Africa and Asia – took part in this scientific forum, which outlined the prospects for the development of Science and Innovation in Europe for the next 15 years.

The forum presented a completely new format for defining the concept of "innovation" as the conversion of new knowledge into economic and social benefits.

Innovation is now seen as a product exclusively of scientific research or technology. The result of innovation activity today depends on organizational, social, economic and other factors. Consequently, the nature of innovation is changing, in fact, as is the economy itself, which now claims to be a knowledge economy.

Based on various studies, Eurostat and OECD scientists agreed and developed a common definition of innovation [1].

Spreading an innovation requires replicating it and communicating information about it to potential users. The availability of a special infrastructure to support innovative educational processes contributes to the spread. It includes various consulting services, training centers, experts, implementation centers etc. In order for the spread of innovation to be successful, it is necessary to analyze how it occurs, identify factors that hinder this process, and implement measures to eliminate them.

Before deciding on the introduction of an innovation, information about which came from outside, the innovation must pass an internal examination. Not always, those innovations that are suitable for one higher education institution can be used in another. Therefore, the expertise carried out during the creation of an innovation, and the expertise carried out at the stage of its assimilation, have both common and different features.

The signing of the association agreement between Ukraine and the EU is a new step towards integration into European educational and scientific spaces through the innovative development of Ukrainian higher education [2].

In the new Law of Ukraine "On Higher Education", the key is the innovative component of the activities of higher educational institutions. In particular, articles 65,66,67,68 define the organizational and legal forms of innovation implementation, and make changes to the financial independence of a higher educational institution.

The implementation of the law will contribute to the integration of Ukraine into a single educational space, without which it is impossible to raise the issue of recognition of Ukrainian diplomas in the world. Continue the education of students and postgraduates at foreign universities, and train highly professional specialists who are able to defend the interests of the state in the difficult geopolitical conditions of our time.

The center of this paradigm is education, which develops as a response to the challenges of civilization and at the same time as a response to human needs to find their place and opportunities for self-realization in the new global space. Education, its organization, directions of development, content and educational technologies are at the epicenter of discussions that have now unfolded in the global intellectual environment.

We are talking about working out a new philosophy of education – education that would ensure a comfortable human existence in the XXI century. The Western world is

trying to cover it with Bologna declarations. In addition, although the main directions of education development in them are defined quite prospectively, there are still more questions than answers. The problem of the general philosophy of education is gradually being established as the main problem of modern world educational policy.

Conclusions

Thus, the methodological analysis of previous research of innovation activity allows us to reveal the specificity of innovations in higher education, to substantiate the paradigm of its innovative development, in which the emphasis is not on the method of transfer, but on the method of knowledge production, which is undoubtedly a significant tool for improving the quality of training. The conceptual basis of this paradigm is formed by cultural-centrist and competence approaches, as well as the theory of contextual learning.

The analysis of the experience of introducing modern learning technologies shows that innovative processes in higher education contribute not only to a significant increase in the theoretical and practical training of students, but also, above all, to the methodological reorientation of educational institutions to the individual, become the basis of a new philosophy of Education [1].

The innovative potential of higher education can and should become a resource for a modernization breakthrough in the development of high-tech sectors of the economy, promising scientific areas, and the formation of modern socio-cultural standards of life.

The role of innovative technologies in Higher School practice is substantiated. Factors of effectiveness of the educational process are highlighted. Technology is defined as a phenomenon and its importance is emphasized, it is indicated that it is a component of human history, a form of expression of intelligence focused on solving important problems of being, a synthesis of the mind and human abilities. The most frequently used technologies in practice are classified.

We see prospects for further research in the use of system analysis in solving practical issues related to the creation and use of educational equipment and technological training tools.

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