

# Theoretical Principles Of Using Innovative Modern Technologies In Higher Education Institutions

Olha Komar<sup>†</sup>, Ievgen Bazhenkov<sup>††</sup>, Olga Vnukova<sup>†††</sup>  
Halyna Kolomoiets<sup>††††</sup>, Anatolii Yanchyshyn<sup>†††††</sup>, Oksana Polishchuk<sup>††††††</sup>

<sup>†</sup> Department of Professional Methodologies and Innovative Technologies in Primary School, Pavlo Tychyna Uman State Pedagogical University, Ukraine

<sup>††</sup> State Scientific Institution «Institute for Modernization of the Content of Education», Ukraine

<sup>†††</sup> Vocational Education in Technologies and Design, Kyiv National University of Technologies and Design, Ukraine

<sup>††††</sup> Department of Scientific and Methodological Support for Improving the Quality of Education, State Scientific Institution «Institute for Modernization of the Content of Education», Ukraine

<sup>†††††</sup> Department of the Ukrainian Philology, Khmelnytsky National University, Ukraine

<sup>††††††</sup> Department of Management Technologies, National Aviation University, Ukraine

## Summary

The article is assigned to a prelude to the joke of effective pedagogical technologies in professional education in the minds of iï continuity. Analyzed the definitions "innovation", "technology", "pedagogical technology", "Innovation pedagogical technology". Blocks have been added, which are stored in innovation processes in the light. The significant role of innovation in education is stated. Presented warehouses pedagogical technologies: conceptual, conceptual-processual and professional.

The purpose of introducing innovative technologies into the educational process of vocational education institutions has been clarified. The reasons for finding and implementing innovative pedagogical technologies in education are analyzed.

### Key words:

*information technology, technologies, education system, innovative educational technologies.*

## 1. Introduction

In modern pedagogy, many directions, technologies, teaching methods for students of different ages have been developed, aimed at mastering ICT to the fullest extent of its capabilities.

Thus, the concept of "teaching methods" is associated with the concept of a set of techniques and approaches that reflect the form of interaction between students and teachers in the learning process. The ICT teaching methodology, therefore, should include a description of various pedagogical actions, the purpose of which is to achieve a productive learning result in the process of mastering this area of knowledge. Such a methodology strives for universality, that is, to ensure that it can be used

in educational situations in working with students who are at different levels of knowledge of ICT.

To help the teacher in solving this difficult task can be:

A combination of traditional (lecture, frontal survey, visibility, etc.) and innovative (case method, project, etc.) teaching methods.

... Strict adherence in the selection, presentation of material and organization of the lesson to the didactic principles of systematicity, consistency, accessibility, differentiated approach, scientific character developed in psychological and pedagogical science.

The use of modern pedagogical technologies (integrated, game, etc.).

Improving the teacher's competence in mastering ICT and modern approaches to teaching (personality-oriented, competence-based, activity-based, etc.).

The use of ICT in the classroom itself is an effective innovative method that allows you to make the learning process mobile, differentiated, individual, interactive. All methods are characterized by taking into account such an important requirement for the learning process as the optimal combination of individual and group work. The creators of the techniques strive to separate the functions that the computer performs. Thus, as a teacher, a computer acts as a source of educational information; visual aid; means of control. The functions of a computer as a working tool are to help in preparing texts, performing calculations, etc.

It is important that many authors of the methods build them in such a way that, using the example of the proposed programs, teachers can create their own author's educational and methodological complex. For this, the teaching aids include lesson plans, crosswords, problems created by means of computer programs.

The object of the research is innovative pedagogical technologies. The subject of the research is the practice of applying innovative pedagogical technologies.

The purpose of this work is to identify the role of pedagogical innovative technologies in teaching [2-6].

The tasks of the work are reduced to the following main ones:

description of pedagogical innovative technologies used at the present stage of teaching;

comparative analysis of innovative and traditional educational technologies;

analysis of the possibilities of using pedagogical innovative technologies in the educational process;

practical illustration of the possibilities of using pedagogical innovative technologies in teaching.

## 2. Theoretical Consideration

The problem of differences in technologies and methods is still quite controversial. Some scientists believe that technology is a form of implementation of a technique, others say that the concept of technology is broader than a technique. Therefore, it is easy to confuse the two. To prevent this from happening, you need to know that the priority issue of methodology is "how", and technology is "how to do it optimally". The teaching method and the technology of teaching a certain discipline are often used as synonyms: the difference between them lies primarily in the placement of accents. In technology, the target, procedural, quantitative and calculated components are more represented. The ideal technology has a rigidly defined system of prescriptions that are guaranteed to lead to the goal. The methodology presents the substantive, qualitative and variable sides. The methodology provides for a variety, variability of ways to implement theoretical provisions, and therefore, does not imply a guarantee of achieving the goal, i.e. even an ideal technique is not highly instrumental.

Ideal technology and ideal methodology are very rare, any didactic (pedagogical) system, depending on the level of its instrumentality, can be closer either to technology (high level of instrumentation) or to methodology (low level of instrumentation).

The instrumental nature of pedagogical technologies is the elaboration and algorithmization of specific actions (starting with setting goals), the certainty and clarity of the stages, steps, operations leading to the goal. Only in such cases is the reproducibility of the technology and the guarantee of the result ensured.

The degree of instrumentality can be a sign of the approach of the didactic system either to technology or to a methodology.

But the picture of the relationship between the terms "technique" and "technology" is complicated by the fact

that the term "technique" has many meanings that differ in level and scope [7].

The teaching methodology of the academic discipline contains a large number of modular and local methods. All this existing diversity leads to the fact that sometimes methods are included in the composition of technologies, and sometimes, on the contrary, certain technologies are included in the composition of teaching methods.

The concept of "technology" used to refer to the sphere of industrial production and meant a system of interrelated methods of processing various materials and methods of manufacturing a particular type of product.

In a short dictionary of foreign words, the definition is given: "Technology (Greek *techne* skill + *logos* teaching) is a body of knowledge about the methods and means of carrying out production processes, as well as the very processes in which a qualitative change in the processed object occurs." As you can see, this concept is considered in the context of industrial production [5].

In an even narrower production context, this concept is disclosed in the encyclopedic dictionary: "Technology is a set of methods of processing, manufacturing, changing the state, properties, form of raw materials, materials or semi-finished products carried out in the production process. The task of technology as a science is to identify physical, chemical, mechanical and other regularities in order to determine and use in practice the most efficient and economical production processes."

However, despite such a narrow production context of the concept of "technology", we note that the defining feature of this concept is the aggregate ("the aggregate of knowledge about ...", "the aggregate of methods ..."). In the definitions of the concept of "pedagogical technology" this feature is also a priority. So, in the pedagogical encyclopedia, "pedagogical technology" is interpreted as "a set of means and methods for reproducing theoretically grounded learning and education processes, which make it possible to successfully implement the set educational goals."

The use by teachers in practice of individual elements of the methodology or separately taken pedagogical techniques should not be called so fashionable at the present time by the term "pedagogical technology". The technology cannot be applied by separate elements, it is an integral process. Imagine, for example, that in the production of a specific food product, for example, a certain type of cheese or yoghurt, separate technological methods are used. It is unlikely that then the manufacturer will receive this variety, in order to obtain it, it is necessary to carefully observe the entire technological chain (raw materials, sequence of actions, time of each stage, etc.) [3].

On the other hand, even full compliance with the entire technological chain does not always lead to the desired result. Similar inconsistencies are observed in school

practice when it comes to the use of pedagogical technologies. The teacher applies individual elements of a particular technology, but the expected result is not observed.

At the same time, in practice, the opposite phenomenon often occurs. It would seem that the teacher completely builds his pedagogical activity in accordance with one or another pedagogical technology, that is, so that all the actions included in it are presented in a certain sequence and presuppose the achievement of the necessary, predictable result, but this is still not observed.

At the same time, a review of the materials in which the concept of "educational technology" appears, shows that it is used most often in the context of "learning technology". In addition, the Russian Pedagogical Encyclopedia notes that in any pedagogical system, pedagogical technology is a concept that interacts with a didactic task. If a didactic task expresses the goals of teaching and upbringing, then pedagogical technology is the ways and means of achieving them. There are also three components of pedagogical technology: didactic processes (prescriptions of methods of activity); organizational forms of training (conditions in which this activity should be implemented); the means of carrying out this activity (purposeful preparation of the teacher-teacher for classes and the availability of appropriate TCO).

To reproduce this or that pedagogical technology, it is very important to have it as complete as possible.

The description of the technology presupposes the disclosure of all its main characteristics, which makes it possible to reproduce it.

A brief description of educational technology can be presented in the following structure (the description of advanced pedagogical experience is carried out in a similar way).

1. The name of the technology, reflecting the main problem to be solved, the main qualities, the fundamental idea, the essence of the applied training system, and finally, the main direction of modernization of the educational process or a typical regional (local) situation. The name of a technology is often given one by one, its most striking feature.

## 2. Target orientations of technology

2. The system of goals is the pivot or leitmotif that holds the harmony of the technology and gives it a face. Referring to the category "goal" characterizes the activity position, orientation to a certain area of human development. The goals and objectives, the achievement and solution of which is planned in technology, are characterized, a tree of goals and objectives, a model of student development in stages are built.

## 3. Conceptual basis of pedagogical technology

3. A brief description of the guiding ideas, principles of technology is given, contributing to the understanding, interpretation of its construction and

functioning, including philosophical positions, the factors and patterns of development used, the scientific concept of mastering experience, the methods of education used.

## 4. Content of UVP

4. The content and structure of the EPP (pedagogical activity of teachers and students) within the framework of technology is considered from the standpoint of modern ideas and theories of education, the principles of consistency, compliance with goals and social order. The volume and nature of the content of teaching and educational influences, the structure of educational plans, materials, programs are indicated.

## 5. Procedural characteristics (methodological features)

In the procedural characteristics of the technology, first of all, the methods and forms of organization of the CEP, the structure and algorithms of the activities of subjects and objects, the complex application and interaction of all methodological tools, management adequate to the goals and objectives, the contingent of trainees are disclosed. The motivational characteristics, peculiarities of the methodology, application of methods and means of teaching, management and organizational forms of the pedagogical process (diagnostics, planning, regulations, correction) are described [2].

## 6. Educational and methodological support

Software and methodological support (curricula and programs, teaching and methodological aids, didactic materials, visual and technical teaching aids, diagnostic tools) are considered in close connection with the content and methods used.

When working on a certain technology, technological schemes and maps are used.

Technological diagram is a conventional image (description) of a process algorithm, its representation in the form of functional or structural elements and designation (graphic, symbolic) of logical connections between them.

Technological map - a description of the technological process in the form of a step-by-step, step-by-step sequence of actions (often in graphical form) with an indication of the means used.

To work on a specific technology, it is necessary to clearly understand the procedural - activity component of this technology.

The teacher (teacher) himself chooses (develops) pedagogical technology (PT)) When choosing (developing) PT, they usually proceed from:

priority of learning goals (in the learning process, a number of goals are often realized, but at different stages of learning, preference is given to certain goals); the specifics of the content of training (educational material). So, all teaching technologies based on modeling professional activity in the educational process are characteristic mainly for academic disciplines of a special cycle. Activity learning technologies are used mainly in

disciplines related to the formation of skills (foreign language, drawing, various workshops, etc.);

- the composition of students [1,8].

a) age (and hence the degree of independence in mastering the content and other characteristics);

b) the level of preparedness (different training technologies in secondary specialized and higher educational institutions, at the first and subsequent stages of training);

c) physical condition (disabled, people with impaired health);

d) the number of students (differences in the technology of individual training, training in small groups, training in a training group, streaming training, mass training - by correspondence, on television, etc.).

The equipment of the educational process must also be taken into account when choosing pedagogical technologies.

The modeling of professional activity in the educational process is realized only when it is possible to simulate the corresponding production situation, having the proper equipment in the form of both simulators and the selection of the necessary regulatory documentation for each worker individually or in a small group. Programmed learning is possible if the appropriate machine park and software are available. The use of new information technologies requires an appropriate database or inclusion in the general informatization system of the country.

Thus, the emergence of new teaching aids encourages the creation of new technologies, taking into account the possibilities of their effective use.

Apparently, the essence of the problem outlined above lies precisely in the fact that in practice, pedagogical technology is often mistaken and given out only as its variable, didactic component - teaching technology. But mastery of teaching technology is not enough for the professional success of a teacher.

So, for example, the pedagogical skill of the teacher in improving the pedagogical technology. In his opinion, the improvement of pedagogical technology presupposes "strict scientific design and accurate reproduction in the classroom that guarantee the success of pedagogical processes, and not hope for a mythical, out of nowhere, pedagogical skill of the teacher". However, let's get back to the very concept of "technology".

Translated from Greek, *techne* means skill, and *logos* means learning, that is, literally "technology" is translated as "teaching about skill." Indeed, a teacher can know well the content of teaching, own teaching methods, he can understand the issues of school psychology, but in the absence of communicative, emotional and creative abilities, he will most likely not be able to achieve success in his teaching activities. Therefore, it seems that it is the pedagogical skill of the teacher that is the key to the success of any pedagogical technology. Probably, to the

three components of pedagogical technology - didactic processes, organizational forms of teaching and means of carrying out this activity, it would be fair to add the fourth - the pedagogical skill of the teacher.

We now turn to the characteristics of various technologies, both "educational" and "pedagogical", although the boundaries of these concepts, as will be seen from the tables below, are very blurred - in both cases, as the review of sources shows, the authors mean, first of all, learning technologies.

Technologies of multilevel education and modular training belong, along with explanatory and illustrative teaching, to the group of technologies of traditional teaching, and in the second, only explanatory and illustrative teaching technologies are assigned to this group. In fact, all attempts to modernize traditional education do not solve the problem of its transformation. In essence, both multilevel education and modular education remain, although more progressive, but still traditional, since, as before, they are aimed at "adapting" the student to the existing content of education. The student, as he was deprived of the right to choose the content of education, did not receive this right even with the use of multilevel or modular learning technologies. For the sake of fairness, we note that these technologies, in any case, implement the variable component of education - the choice of content within the boundaries of curricula.

The formation of the cognitive interest of students in the learning process occurs due to their inclusion in joint activities, the organization of independent work of students [6].

Didactic means stimulate the cognitive activity and interest of the trainees, firstly, aimed at obtaining information about the upcoming cognitive activity. It can be a variety of texts from fiction, legends, stories, examples. Secondly, didactic tools that help to highlight the main subject of study, such as various devices, didactic games, dummies, computer training programs. Thirdly, didactic means stimulating functional mental activity in the form of material objects, carrying information about the procedure of activity.

The experience of the effective use of ICT in the educational process testifies to the significant possibilities of information and communication technologies in the implementation of the ideas of the competence-based approach and, in particular, cultural and historical pedagogy.

The goal of education is to pass on the values of culture to the next generations and teach them to live in a rapidly changing world. The educational process, by definition, is focused primarily on the transfer of cultural values to the student; it is also clear that the ability to live in a rapidly changing world is best shaped by effectively taught ICTs. The introduction of ICT helps the student and teacher in overcoming the perception of culture as "a shop of

antiquities, where beautiful but long-worked material is stored”, creates conditions for the real inclusion of a young person in the context of culture, primarily through the use of the project method.

Project activity allows students to acquire additional knowledge in the subject area of interest to them, to learn how to plan their own cognitive activities, to master the basic software necessary for a modern PC user [1].

Possessing significant resources to ensure that the student's needs for self-expression and self-realization are met, ICTs develop in the young person the ability to live in harmony with himself and others. This naturally improves the process of developing such key competencies as responsibility and the ability to make decisions in a situation of choice.

The peculiarity of cultural and historical pedagogy is that one of its meaning-forming foundations is the establishment of a correspondence between the development of the creative abilities of an individual and the formation of a solid base of skills and abilities. ICT develops a performing culture in the student - an essential factor in the rational balance of creativity and ability to patiently and efficiently perform daily routine work.

Information and communication technologies help to strengthen the upbringing function of education, a new high-quality level of education is achieved, which is expressed in the ability of students to find and process information, master knowledge and skills that are effectively applicable in any area of life, independently make decisions in a situation of choice [2-4].

The rapidly renewing information component of the culture of the social environment changes the traditional ideas about the essence of education as an externally controlled process of teaching, upbringing and development of a child within the strict framework of the dominant relations "teacher-student", "teacher-student". The improvement of the system of sources of socio-cultural experience available to students and changes in the scale of information support of education, together with the processes of its democratization, convince us that the foundations of educational practice in the near future will fully represent a wider range of social relations. The essence of these relations is determined by a different scheme of interaction, namely "the individual information - educational environment", and their content is the initiative educational activity of the subject of learning in the global information system [3].

The teacher as a source of information, previously leading in the "information field" of the education system, is gradually being ousted from their usual positions. New trends in the development of the information culture of society in no way exclude the teacher from the education system, but entail changes in the correlation of his functions - the function of the organizer of the learning interaction of students with various sources of information

and the formation of students' skills and abilities of independent information consumption.

Awaken and support the educational initiative of students. To create the necessary conditions for students to study independently (and learn) in a wide information and educational environment.

Provide qualified assistance in identifying significant areas.

Correct the success of the learning and teaching process and optimize it in terms of means and methods of achieving results.

The composition of information sources of the learning environment at the present stage of the development of society has been significantly enriched due to the formation and rapid development of a computer information network in the field of education. The virtual information environment has specific material. Its constituent parts:

apparatus for presenting educational information;

orientation apparatus;

apparatus for the assimilation of educational material.

In a virtual mode of operation, they have a number of indisputable advantages in comparison with traditional sources of knowledge [5].

The educational power of the virtual environment in the context of the rapid improvement of the technology of production of computer technology, which determines the speed of processing and transfer of information, the information capacity of a computer, the emergence of opportunities for storing information on various media, is steadily growing. This circumstance obliges the teaching community to adequately assess the virtual environment as part of other sources of information in terms of the scale and effectiveness of its educational impact.

Software-pedagogical tools (PPP) form various types of subject electronic educational publications. By now, a certain system of them has been formed.

Types of information and communication pedagogical technologies:

electronic textbooks;

electronic encyclopedias;

electronic directories;

electronic catalogs: drawings, photos, illustrations, models, videos, tables, diagrams, thematic presentations, etc.;

electronic libraries (catalogs and corresponding collections: electronic versions of textbooks, teaching aids);

learning environments that include: the use of a set of means of teaching influence - motivation of learning, presentation of material, working out, control; the interactive nature of learning and the variability of its methods in two of their varieties:

scripts;

simulation environments (electronic designers as a special case of the simulation environment)

electronic simulators;  
electronic tests.

But this whole set of tools does not allow the teacher to create, so he chooses to study programs that will allow him and his students to create their own methodological complexes in accordance with the chosen program, textbook, understanding the need for knowledge at the modern stage of life.

Thus, the means and forms of media education give the teacher opportunities for professional growth and self-improvement in the way of using the latest achievements of science and information technology. The latter contributes to the renewal of the content and forms of modern education.

### Conclusions

An educational institution is innovative if the educational process is based on the principle of nature conservation, the pedagogical system evolves in a humanistic direction, the organization of the educational process does not lead to overloads of students and teachers, improved results of the educational process are achieved through the use of undisclosed and not involved Before the capabilities of the system, the productivity of the educational process is not only a direct consequence of the introduction of expensive tools and media systems.

These criteria make it possible to really determine the degree of innovativeness of any educational institution, regardless of its name. The features of an innovative educational institution can be identified in comparison with traditional institutions.

### 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, Politics 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] McMillan R. Man Builds Twitter Bot That Humans Actually Like. *Wired*. URL: [wired.com/2012/06/twitter\\_arm/](http://wired.com/2012/06/twitter_arm/)
- [6] 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.
- [7] 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.
- [8] Rampton S., Stauber J. *Trust us! We're experts: How industry manipulates science and gambles with your future*. Tarcher. 2002.