# The use of pedagogical technologies for the organization of the educational process in institutions of higher education

## El uso de tecnologías pedagógicas para la organización del proceso educativo en instituciones de educación superior

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## Abstract

Currently, the educational and training process is characterized by the search for such pedagogical technologies that would maximally contribute to forming a socially active, creative personality capable

of independently regulating his life activities. The purpose of the academic paper is to study the theoretical fundamentals of the features of applying various pedagogical technologies. In the course of the present research, analysis, synthesis, induction and deduction were used to process scientific information. Based on the research results, the existing pedagogical technologies of organizing the educational process in the higher education sphere were studied from the perspective of their effectiveness.

**Keywords:** application of learning technologies, the teacher's effective technological activity, optimality of educational technology of higher educational institutions, scientific organization of the educational process, technological teaching tools.

**Resumen**

Actualmente, el proceso educativo y de formación se caracteriza por la búsqueda de tecnologías pedagógicas que contribuyan al máximo a formar una personalidad socialmente activa y creativa capaz de regular de forma independiente sus actividades de vida. El propósito del trabajo académico es estudiar los fundamentos teóricos de las características de aplicar diversas tecnologías pedagógicas. En el transcurso de la presente investigación se utilizó el análisis, la síntesis, la inducción y la deducción para procesar la información científica. Con base en los resultados de la investigación, se estudiaron las tecnologías pedagógicas existentes de organización del proceso educativo en el ámbito de la educación superior desde la perspectiva de su eficacia.

**Palabras clave:** aplicación de tecnologías de aprendizaje, actividad tecnológica efectiva del docente, optimización de la tecnología educativa de las instituciones de educación superior, organización científica del proceso educativo, herramientas tecnológicas de enseñanza.

## 1. Introduction

Effective education system development involves introducing and implementing innovative educational systems and technologies. The degree of implementing the latest technological approaches is one of the most important criteria for determining the educational institution's competitiveness and prestige. After all, pedagogical technologies ensure systematicity, expediency, efficiency and effectiveness of its activity. Pedagogical technologies contribute to increasing the motivation of the educational process' participants toward knowledge acquisition. The connection of the educational material with the real challenges of nowadays is also monitored. The variety of functions of educational technologies is explained by the variability of their structure, the components of which, in addition to traditional ones, are the newest means of the educational process. In particular, these include interactive information and communication technologies, as well as distance forms of educational organization, which are currently used and have gained particular popularity around the world.

The theoretical part of the present research substantiates the relevance, components and main theoretical features of developing pedagogical technologies for organizing the educational process at higher educational institutions.

The practical part of the research includes establishing the most significant and priority types of pedagogical technologies in terms of the effectiveness of their application in organizing the educational process at higher educational institutions. These are features characterizing the concept of pedagogical technologies, requirements for pedagogical technologies from the perspective of their most effective application in organizing the educational process. The practical

part of the research also determines the basic and most effective types of universal pedagogical technologies used in higher education, as well as the most promising areas of studying features of using the technologies for organizing the educational process at higher educational institutions.

Based on the research results, conclusions were drawn regarding the most significant types of pedagogical technologies that can be applied in higher education. These are management and information technologies. The survey showed that the features defining the concept of pedagogical technologies are models of the educational process in accordance with the outlined goal and a set of actions or activities. The respondents believe that diagnostic goal setting and efficiency, as well as algorithmicity and designing are the main requirements for pedagogical technologies in terms of their most effective application in organizing the educational process at higher educational institutions.

According to the survey participants' viewpoints, the project method and game technologies are the basic and most universal directions of new pedagogical technologies. By the way, the respondents also revealed the most promising areas of the scientific study of applying the technologies in organizing the educational process in higher education. These are the analysis of target orientations, conceptual specifications, the results of training and education, and the analysis of time usefulness and intellectual investments in implementing the pedagogical technologies.

## 2. Literature Review

Currently, the interaction of various pedagogical systems and teaching technologies has gained considerable popularity, which in practice tests both new forms and integral pedagogical systems of the past (Akour & Alenezi, 2022).

Pedagogical technology is a method of joint action of the teacher and students, characterized primarily by consistency in performing actions, constant and systematic measurement of the level of upbringing and the formation of educational qualities, the interconnection of the technology's main elements (Kramarenko et al., 2022).

The latest development of the education system involves introducing pedagogical practice, purposeful managerial influence on the educational system, retraining of pedagogical personnel, significant corrections in the content, styles of activity of pedagogical institutions.

Dissatisfaction with specialists' training quality in practice and awareness of the need to reform the work of educational institutions lead to the need to update professional training and a teacher's style of professional activity. It is especially significant to develop his competencies, personal and professional qualities, ability to live and work in new conditions, perceive and understand new challenges of society (You, 2022).

The basic stages of implementing an educational technology are as follows: goal setting (exact definition of the desired result as a student's set of actions); diagnostics (recognition of the initial level of observed actions); formulation (establishing a program of joint work between the teacher and students, or "writing a recipe for action"); implementation of the technological process (ensuring the conditions for program execution); assessment and correction of results (comparison of results with an established standard) (Akour & Alenezi, 2022).

Some scientists tend to consider pedagogical technology the part of pedagogical science, which studies and develops the purpose, content and means of achieving planned learning outcomes. Other scholars consider pedagogical technology as knowledge about pedagogical activity carried out with the help of certain means (Tran et al., 2021; You, 2022).

From another point of view, pedagogical technology is "the ability to design the pedagogical process by the set goal and taking into account the specific conditions of activity". It is "a particular order, logic and sequence in accordance with the set goal, to a certain extent the algorithmization of the joint activity of the teacher and students in the educational process, the coherence of their actions and relationships" (Lai, Saab & Admiraal, 2022).

Several publications use the term "teaching technique" for the educational process, and the term "pedagogical technique" for teaching. In this context, the term "pedagogical technique" is used as "a set of scientifically based methods of educational influence on a person or a group of people" or as "a reasonable choice of the type of operational influence during the teacher's interaction with children for the maximum development of the personality as a subject", or as a system of knowledge necessary for the teacher to implement the strategy, tactics, and procedure of training (Bılyk et al., 2021).

Two components were identified in pedagogical technology: the use of system knowledge to solve practical problems and the use of technological tools in the educational process. Unlike the term "educational technology", which was synonymous with "technical educational resources", "pedagogical technology" should be understood as a scientific description (set of means and methods) of the educational process. Currently, modern pedagogical technology is considered primarily as a system of the most rational means for achieving the pedagogical goal, the scientific organization of the educational process (Kučera, 2021).

The scientific and pedagogical literature analysis shows that all signs of pedagogical technologies are divided into general and specific ones. For instance, common features are inherent in any technology (processuality, availability of a complex of methods for measuring the state of the object, focus on the design and use of effective and economical processes) (Wang et al., 2019).

From among the features of pedagogical technologies, which must meet the main methodical requirements and criteria of manufacturability, the following are distinguished:

‒ conceptuality (on the basis of a specific concept, which includes philosophical, psychological, didactic and social-pedagogical justifications, contains educational goals). Conceptuality is considered in terms of innovation, alternative, humanism, democracy and modernity;
‒ systematicity (pedagogical technique must have all the signs of a system, as the expected efficiency and reproducibility depend entirely on it);
‒ logic of the process;
‒ sequence and connection of all its parts;
‒ expediency of individual elements, integrity;
‒ manageability (the possibility of setting goals, designing the learning process, step-by-step diagnostics, varying means and methods for correcting results);
‒ efficiency (guarantee of achieving the planned result – a certain standard of preparation, optimal costs);
‒ reproducibility (possibility of applying under other similar conditions by other institutions);

- the unity of content and procedural parts, their interdependence, the complexity of the entire methodological toolkit;
- correspondence of the content of education and the contingent of educational subjects (Double, McGrane & Hopfenbeck, 2020; Orji, Ojadi & Okwara, 2022).

Mastering new training and educational technologies requires the teacher's internal readiness to work seriously on his professional growth (Knoche, 2022).

The purpose of the research is to determine the standpoint of scientists and heads of higher educational institutions regarding the features of using various types of pedagogical technologies in organizing the educational process of higher education and, based on the results of the analysis of the respondents' viewpoints, to reveal the most promising directions of scientific research in the outlined sphere.

## 3. Methodology

A practical study of modern tendencies in applying pedagogical technologies in organizing the educational process at higher educational institutions was carried out by surveying 411 scientific employees whose scientific and professional development is related to the technology of organizing the educational process at higher educational institutions, as well as 317 teachers of higher educational institutions conducting their professional activities in 14 educational institutions of higher education of Ukraine. The research was conducted using the Survey Planet service.

## 4. Results and Discussion

At the beginning of the survey, the respondents were asked to evaluate the importance and priority of various types of pedagogical technologies in terms of their effective application in organizing the educational process in higher education.

According to the survey participants' standpoint, the most significant types of pedagogical technologies that can be used in higher education are as follows (Figure 1).

- management technologies;
- information technologies.

At the same time, it is worth noting that a particular group of educational technologies - information technologies scored a relatively large percentage of points. These are cross-cutting and separate groups of technologies used in education, training and management.

During the survey, the respondents identified the following features, due to which they define the concept of pedagogical technologies (Figure 2).

Educational technologies are often defined as a model of the educational process in accordance with an outlined goal and a set of actions or activities.

A significant aspect of this survey is the clarification of the requirements for pedagogical technologies from the perspective of their most effective application in organizing the educational process at higher educational institutions.
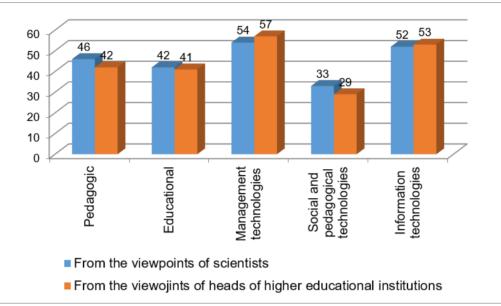
**Figure 1.** The most significant and most priority types of pedagogical technologies in terms of their effective application in organizing the educational process in higher education, %
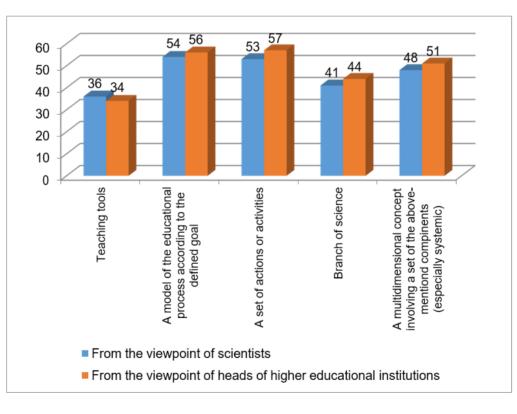*Source: compiled by the authors*



**Figure 2.** Features characterizing the concept of pedagogical technologies, %
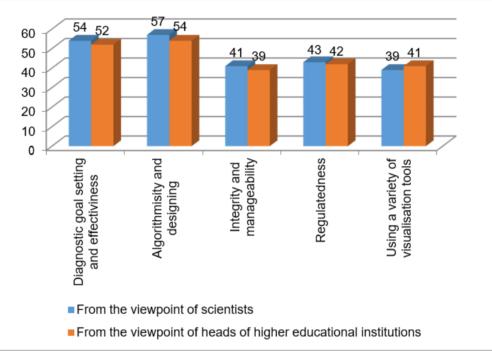*Source: compiled by the authors*

The conducted survey made it possible to reveal the main and most universal directions of new pedagogical technologies (Figure 4).

From among the various directions of new pedagogical technologies that are part of educational technologies, the most effective ones are the project method and game technologies.

An important advantage of the present research is the clarification of the most promising, from the respondents' viewpoints, directions of studying the features of using technologies in organizing the educational process in higher education (Figure 5).



**Figure 3.** Requirements for pedagogical technologies from the perspective of their most effective application in organizing the educational process at higher educational institutions, %
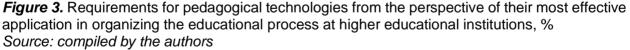*Source: compiled by the authors*

Figure 3 shows that the most significant requirements for pedagogical technologies are diagnostic goal setting and efficiency, algorithmicity and designing.
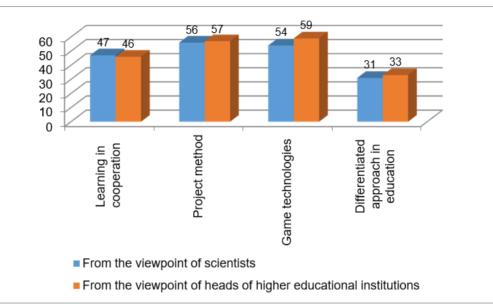
**Figure 4.** The basic and most effective types of universal pedagogical technologies used in higher education, %
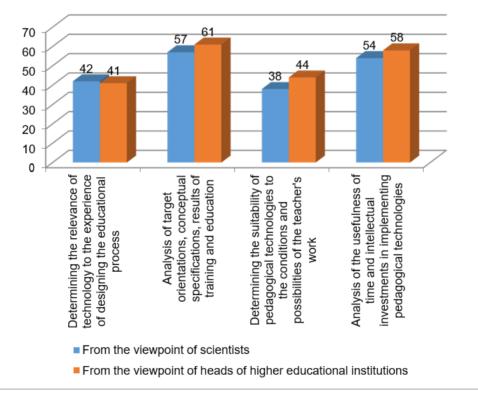*Source: compiled by the authors*



**Figure 5.** The most promising directions of studying the features of using technologies in organizing the educational process in higher education, %.
*Source: compiled by the authors*

It can be seen from Figure 5 that the most promising directions for studying pedagogical technologies for organizing the educational process in higher education are the analysis of target orientations, conceptual specifications, learning and education results, and the analysis of time usefulness and intellectual investments in implementing pedagogical technologies.

The introduction of modern educational technologies into the educational process will contribute to improving the quality of education. In this regard, the main components that should be taken into account in the process of training and educating future specialists are their individual features, the ability of the teacher to use modern educational technologies effectively, didactic focus on developing a positive motivated attitude of the student (Stathopoulou et al., 2019).

The state's social-economic situation is changing, which makes it more important to search for reliable, innovative, and efficient educational methods. It also calls for introducing educational technologies that would ensure the effective preparation of talented and capable students for entering society and the establishment of a social elite capable of ensuring the state's economic and social development at the proper level.

The innovative capacity of modern pedagogical technologies lies not in the algorithms or organizational components specified by their developers, but in the relevance of the chosen topic and content, in modern tools and innovative methods of their implementation (Taimalu & Luik, 2019).

Modern pedagogical technologies of professional training should be based on dialogue, creative cooperation using project and research methods, mutual support and exchange of cultural-informational, spiritual-moral, and emotional-value experiences between participants of the educational process. Such subject-subject interaction ensures the productive cooperation of participants in the educational process. It contributes to establishing new, unique, cultural products of cognitive activity – social, intellectual, cultural, etc. (Fertig & Joseph, 2022).

Modern pedagogical technologies at the current stage of their development should be aimed at updating various thinking strategies, developing cultural models, and developing an appropriate reflection on the challenges of the surrounding reality. Pedagogical technologies, during their application in higher education, generally contribute to developing self-education skills, self-analysis, self-control and self-assessment and require using such extracurricular skills (Romero-Colmenares & Reyes-Rodríguez, 2022).

From this perspective, one of the target orientations of pedagogical technologies should be the development of cognitive qualities of the individual: thinking, memory, imagination, attention, and the need for constant self-development (Wu, Zhou, Li & Chen, 2022).

Pedagogical technologies function as a means of investigating the most rational methods of learning, as well as a system consisting of the most relevant and effective principles, techniques and methods used to achieve the ultimate educational and cultural goals (Røe, Wojniusz & Bjerke, 2022).

Modern pedagogical technology is a synthesis of the achievements of pedagogical science and practice, a combination of elements of traditional past experience and advanced achievements of scientific and technical progress (Okoye et al., 2022a).

Pedagogical technologies are person-oriented due to the humanization and democratization of society. Currently, the sources of new pedagogical technologies are as follows:

– social changes and new pedagogical thinking;
– social-pedagogical and psychological sciences;
– modern advanced pedagogical experience;
– historical domestic and foreign experience (acquired from previous generations);
– traditional pedagogy (Gallagher & Savage, 2022).

Nowadays, a variety of personally-oriented pedagogical technologies are emerging based on activating a student's activity and improving the overall quality of the educational process. Personally oriented training involves using various forms and methods of organizing educational activities, which make it possible to reveal the subjective experience of future specialists. Accordingly, the teacher faces new challenges: creating an atmosphere of each student's interest in the work of the entire group; encouraging them to complete the task without fear of making a mistake or getting the wrong answer; effective use of didactic material at the lesson; assessing the student's activity not only according to the final result but also in the process of its achievement; encouraging the desire of the student to find his own way of working; creation of pedagogical situations of communication in class that allow each student to show initiative and independence in choosing and applying work tools (Okoye et al., 2022b).

## 5. Conclusions

The conducted methodological analysis of the issue under study regarding introducing pedagogical technologies into the modern educational space made it possible to establish that these technologies characterize the general strategy of the development of education, in general, and the educational environment of higher schools, in particular. The principal goal of pedagogical technologies is to forecast the development of pedagogical systems, their design, planning and determination of factors corresponding to educational goals. Conducting a meaningful consideration of the researched problem requires its coverage both at the level of methodological principles and a comprehensive analysis of methodological ways of its implementation.

## 6. Bibliographic references

Akour, M., & Alenezi, M. (2022). Higher Education Future in the Era of Digital Transformation. Education Sciences, 12(11), 784. https://doi.org/10.3390/educsci12110784

Bilyk, V., Yashchuk, S., Marchak, T., Tkachenko, S., & Goncharova, V. (2021). Organization of the Educational Process on Natural Science Training in Higher Education Institutions on the Basis of Innovation and Heuristics. Postmodern Openings, 12(2). doi: https://doi.org/10.18662/po/12.2/298

Double, K. S., McGrane, J. A., & Hopfenbeck, T. N. (2019). The Impact of Peer Assessment on Academic Performance: A Meta-analysis of Control Group Studies. Educational Psychology Review, 32(2), 481–509. doi: https://doi.org/10.1007/s10648-019-09510-3

Fertig, J., & Joseph, M. L. (2022). What management is versus what managers do: An investigation into required management course offerings for undergraduate business students. The International Journal of Management Education, 20(2), 100641. doi: https://doi.org/10.1016/j.ijme.2022.100641

Gallagher, S. E., & Savage, T. (2022). Challenge Based Learning: Recommendations for the Future of Higher Education. In The Emerald Handbook of Challenge Based Learning

(pp. 391–411). Emerald Publishing Limited. doi: https://doi.org/10.1108/978-1-80117-490920221018

Knoche, H. T. (2022). Thinking about cooperative learning: The impacts of epistemic motives and social structure on cooperative learning environments. The International Journal of Management Education, 20(2), 100643. doi: https://doi.org/10.1016/j.ijme.2022.100643

Kramarenko, A., Stepaniuk, K., Bogdanov, I., Alieksieieva, H., & Kempińska, U. (2022). The educational component "Teaching methodology of social and health-care educational sector" under quarantine restrictions. Amazonia Investiga, 11(49), 259–266. https://doi.org/10.34069/ai/2022.49.01.28

Kučera, D. (2021). Challenges of managerial responsibility and ethics for Central and East European countries based on the experience from the Czech Republic. The International Journal of Management Education, 100583. doi: https://doi.org/10.1016/j.ijme.2021.100583

Lai, Y., Saab, N., & Admiraal, W. (2022). University students' use of mobile technology in self-directed language learning: Using the integrative model of behavior prediction. Computers & Education, 179, 104413. doi: https://doi.org/10.1016/j.compedu.2021.104413

Okoye, K., Hussein, H., Arrona-Palacios, A., Quintero, H. N., Ortega, L. O. P., Sanchez, A. L., . . . Hosseini, S. (2022a). Impact of digital technologies upon teaching and learning in higher education in Latin America: an outlook on the reach, barriers, and bottlenecks. Education and Information Technologies. Springer. doi: https://doi.org/10.1007/s10639-022-11214-1

Okoye, K., Nganji, J. T., Escamilla, J., Fung, J. M., & Hosseini, S. (2022b). Impact of global government investment on education and research development: A comparative analysis and demystifying the science, technology, innovation, and education conundrum. Global Transitions, 4, 11–27. doi: https://doi.org/10.1016/j.glt.2022.10.001

Orji, I. J., Ojadi, F., & Okwara, U. K. (2022). Assessing the pre-conditions for the pedagogical use of digital tools in the Nigerian higher education sector. The International Journal of Management Education, 20(2), 100626. doi: https://doi.org/10.1016/j.ijme.2022.100626

Røe, Y., Wojniusz, S., & Bjerke, A. H. (2022). The Digital Transformation of Higher Education Teaching: Four Pedagogical Prescriptions to Move Active Learning Pedagogy Forward. Frontiers in Education, 6. doi: https://doi.org/10.3389/feduc.2021.784701

Romero-Colmenares, L. M., & Reyes-Rodríguez, J. F. (2022). Sustainable entrepreneurial intentions: Exploration of a model based on the theory of planned behaviour among university students in north-east Colombia. The International Journal of Management Education, 20(2), 100627. doi: https://doi.org/10.1016/j.ijme.2022.100627

Stathopoulou, A., Siamagka, N.-T., & Christodoulides, G. (2019). A multi-stakeholder view of social media as a supporting tool in higher education: An educator–student perspective. European Management Journal, 37(4), 421–431. doi: https://doi.org/10.1016/j.emj.2019.01.008

Taimalu, M., & Luik, P. (2019). The impact of beliefs and knowledge on the integration of technology among teacher educators: A path analysis. Teaching and Teacher Education, 79, 101–110. doi: https://doi.org/10.1016/j.tate.2018.12.012

Tran, T. H. U., Lau, K. H., & Ong, C. E. (2021). Adoption of social sustainability practices in an emerging economy: Insights from Vietnamese handicraft organizations. Sustainable Production and Consumption, 28, 1204–1215. doi: https://doi.org/10.1016/j.spc.2021.07.034

Wang, J., Tigelaar, D. E. H., & Admiraal, W. (2019). Connecting rural schools to quality education: Rural teachers' use of digital educational resources. Computers in Human Behavior, 101, 68–76. doi: https://doi.org/10.1016/j.chb.2019.07.009

Wu, D., Zhou, C., Li, Y., & Chen, M. (2022). Factors associated with teachers' competence to develop students' information literacy: A multilevel approach. Computers & Education, 176, 104360. doi: https://doi.org/10.1016/j.compedu.2021.104360

You, J. J. (2022). A 'sensitising' perspective on understanding students' learning experiences in case studies. The International Journal of Management Education, 20(2), 100615. doi: https://doi.org/10.1016/j.ijme.2022.100615