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Innovative pedagogical technologies – the most important resource in modernizing the training of a modern specialist

Інноваційні педагогічні технології – найважливіший ресурс у модернізації підготовки сучасного фахівця

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Abstract

The article analyzes the content lines of innovative pedagogical technologies, information technologies, interactive technologies, humanitarian technologies, knowledge design technologies. The purpose of the article is to consider innovative pedagogical technologies in education and to show their influence on the training of a modern specialist. The main research methodology is the need to organize the process of training specialists, ensure their social interaction in the professional environment of using innovative pedagogical technologies in education and show their impact on the training of a modern specialist based on theory. generations, the priority of project-problem-oriented learning methods associated with educational robotics. The author proved the necessity of virtual and augmented reality technology, which provides new opportunities for

Анотація

У статті проаналізовано змістові лінії інноваційних педагогічних технологій, інформаційних технологій, інтерактивних технологій, гуманітарних технологій, технологій проектування знань. Метою статті є розглянути інноваційні педагогічні технології в освіті та показано їх вплив на підготовку сучасного фахівця. Основною методологією дослідження є необхідність організації процесу підготовки фахівців, забезпечення їх соціальної взаємодії у професійному середовищі застосування інноваційних педагогічних технологій в освіті та показ їх впливу на підготовку сучасного фахівця на основі теорії. покоління, пріоритет проектно-проблемно-орієнтованих методів навчання, пов'язаних з освітньою робототехнікою. Методична

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education and competitiveness of a specialist in the labor market, for self-expression, directing students to continuous independent work and forms self-organization, information culture in them, provides all opportunities for their own learning rhythm. The importance of telecommunication technologies in education is substantiated, the purpose of which is to increase the motivation of education seekers to study and use innovative pedagogical technologies in the workplace for the modernization of the country.

Keywords: innovative technologies, education, specialist training, open education, distance learning.

Introduction

The process of updating the modern education system and reforming it aims to prepare young people for life in the modern digital society. The development of a modern teacher and the improvement of his professional competence is impossible without ensuring the availability and effectiveness of education, individualization and differentiation of the education process, and this goal is precisely these positions that can be satisfied by the introduction of innovative pedagogical technologies into the training of specialists. It is the modern innovative technologies in the educational sector that are the most important resource in the preparation of a modern specialist, in the modernization of his educational component. New educational technologies are necessary criteria for the civilizational development of society, influence people's lives, increase the quality of education throughout the world, regardless of the settlement, city, and remoteness. In the conditions of reforming education, the use of the latest means of life significantly updates and even changes the character of a person's existence, his professional activity. With this approach, the most important tasks of education and human life are the preparation of a creative and educated personality with the mandatory formation of competencies for an effective life position and professional activity (Vovk, & Matvienko, 2020). So, we see the urgency of the problem of developing and implementing technologies in the educational sector that should

концепція відображає взаємовплив різних підходів до навчання та їх співвідношення з інноваційними педагогічними технологіями в освіті, показуючи їх вплив на підготовку сучасного фахівця. Ці підходи розглянуті нами у статті. Автором доведено необхідність технології віртуальної та доповненої реальності, яка надає нові можливості для освіти і конкурентоздатності спеціаліста на ринку праці, для самовираження, спрямування студентів на неперервну самостійну роботу та формує у них самоорганізацію, інформаційну культуру, дає всі можливості для власного ритму навчання. Доведено важливість для освіти та роботи технологій штучного інтелекту, машинного навчання, нейронних мереж, підкреслено їх роль у створенні більш досконалих природних користувацьких інтерфейсів.

Ключові слова: інноваційні технології, освіта, підготовка фахівця, відкрита освіта, дистанційне навчання.

ensure high-quality training of future specialists under the requirements of the labor market and modern society (Gurevich, 2014).

Innovative pedagogical technologies are not only considered as a disposition to perceive, produce, and apply new things, but primarily as an openness that encourages individual development. They provide conditions for the development of the individual, the exercise of his right to individual creative contribution, personal initiative, and freedom of self-development.

Innovative pedagogical technologies have a humanistic orientation in the education system, due to the coexistence and complex relationships in scientific pedagogy and pedagogical practice of traditional scientific pedagogy. They belong to the system of general scientific and pedagogical knowledge. They arose and are developing on the border of general innovation, methodology, theory and history of pedagogy, psychology, sociology and theory of management, economics of education. Innovative pedagogical technologies are one of the dominant trends in human development.

Innovative pedagogical technologies are specific and quite complex, requiring special knowledge, skills, and abilities. Innovative pedagogical technologies in the education system testify to a qualitatively new stage of interaction and development of scientific-pedagogical and

pedagogical creativity and the processes of applying its results.

The article examines innovative technologies aimed at intensifying activities in the educational process and contributing to the development of individual subjects. A positive point is the focus of information technologies on mastering new search tools, which we present in the article, the use of which is necessary for processing scientific and educational information.

The article highlights the factors that influence the student's effective work on the project and its successful construction.

The authors of the article offer blogs that are used by teachers and students in the educational process using innovative technologies. The classification of innovative educational technologies by groups is also shown.

Literature Review

I. Dychkivska (2004) examines the complex and multifaceted phenomenon of innovative activity, which in its content satisfies the interaction of individuals, creates a process aimed at the transformation of the object, its professional development, and contributes to its transfer to a qualitatively new state. Innovative system activity is presented as a special type of creative activity aimed at combining various operations and actions, which as a result will ensure the acquisition of new technologies, knowledge, development application of new means, and systems for creating innovations in education.

N. Navolokova (2009) characterized various pedagogical technologies, presented recommendations for practical use, and presented modern approaches to lesson design.

R. Gurevich (2014) analyzed innovative pedagogical technologies in education and showed their influence on the training of a modern specialist, showed the application of modern learning technologies in the educational process of higher education institutions in integration with the use of Internet services, and proved their influence on the quality of training of a future specialist.

M. Kyrychenko, & L. Sergeeva (2018) reveal modern scientific approaches, innovative technologies in education, their impact on the training of a modern specialist, and single out the directions, trends, conditions, and technologies for spreading the principles of open education.

Since modernity points to the need to unite specialists in various fields of knowledge to implement significant innovative changes in the open education movement, all sides of the educational process are involved in their analysis, the objectivity of the quality of education for employers, students of education, and society is presented and proven.

O. Chubukova, & I. Ponomarenko (2018) singled out the newest and most significant technologies, these are virtual and augmented reality. Common and distinctive features are singled out, their essence and necessity in the process of creating relevant products are shown, and their specific use by companies.

V. Kovalchuk, & A. Shcherbak (2018) investigated the theory and practical implementation of innovative technologies. The positions identified as the organizational beginning of the educational field, which directs all work in the necessary direction, using not only creative approaches, scientific knowledge, and pedagogical experience, but also the content of education.

T. Desyatov (2020) analyzed the content of training and outlined the ways of its organization when using digital content. Ways are proposed that give students the maximum opportunity to independently study theoretical material, learn the practice of knowledge and leave contact time for acquiring knowledge, practical skills, subject discussions, and laboratory workshops.

O. Onats (2018) a study was conducted in the managerial activity of the head of an educational institution, the essence of the content of innovative technologies in managerial activity was revealed; the features of management technologies are described, the areas of their application are shown; proposed extrapolated effective standards of management technologies from the field of business and economy, which will be useful in the management process of educational institutions to ensure its effectiveness.

S. Sysoeva & Osadcha (2019) conducted a study of the current state of distance learning, showed the possibilities of using distance learning technologies in institutions of higher education; an analysis of technologies in institutions of higher education that contribute to the application of remote technologies is made.

O. Polevikova and Zh. Shurda (2019) developed an innovative technology that ensures interactive

work among children in pairs of varying composition. This approach promotes equality between the children and the teacher, encouraging the formation of values, abilities, and skills while creating an atmosphere of cooperation in the classroom. Additionally, the authors provide methodical tips for working in pairs of variable composition.

N. Machynska, & Yu. Komarova (2015) based on modern pedagogical practice, analysis of theoretical provisions, showed the features and essence of innovative education, showed the impact of such education on students and teachers; proposed ways to implement innovative approaches to the educational process in higher education, and characterized innovative learning models.

V. Senchenko, O. Shestopal, & N. Nasonova (2018) considered the possibilities for creating a new concept of education, which includes changes taking place in education about the most promising innovative technologies for the realization of the goals of education, personally oriented learning, and the introduction of innovative technologies. The problems are analyzed and the prospects for the introduction of information technologies and distance learning, and their development.

Methodology

In today's demanding and rapidly changing socio-economic environment, the level of education, its influence on the personal development of a specialist, will largely depend on the effectiveness of the introduction of innovative learning technologies based on new methodological principles, modern didactic principles and psychological and pedagogical theories that develop different approaches to teaching.

The following methods were used in the article to implement the formulated tasks and achieve the goal: analysis of pedagogical, psychological, and methodical literature, synthesis, comparison, comparison and generalization, induction and deduction, analogy, which made it possible to characterize the state of working out the problem; systematization and generalization of theoretical and methodical principles for clarifying the state of training of a modern specialist; generalization, modeling for the development of conclusions and proposals on the topic of research.

Also, the methodological basis of the research is: fundamental provisions of the theory of

knowledge (historicism, systematicity, objectivity, interdependence); dialectical principles of interconnection and integrity of phenomena of pedagogical reality, unity of objective and subjective, pedagogical theory and practice; leading scientific ideas of philosophy and sociology regarding the determinism of innovative changes in modern education by the general trends of civilizational development; theories of general and pedagogical innovation: neology – creation of the new, axiology – perception and evaluation of the value of the new; praxeology - the use and application of the new to the organization of the process of implementing educational innovations.

The methodological basis of the article is the main provisions and approaches to the learning process, which imply accurate instrumental management of the learning process and guaranteed achievement of the set educational goals.

During the search stage, theoretical and methodological analysis of psychological and pedagogical literature, study of scientific documents regulating the innovative training of students at the university, analysis and synthesis of search results in information and search electronic systems in order to clarify basic concepts, study and analysis of pedagogical experience were used. This made it possible to reveal the degree of development of the problem and to determine pedagogical technologies that work most effectively to increase the efficiency of professional training of specialists.

The main methodology of the research is the need to organize the process of training specialists, ensure their social interaction in the professional environment of the application of innovative pedagogical technologies in education, and show their influence on the training of a modern specialist based on the theory of generations, the priority of project-based and problem-oriented teaching methods related to educational robotics.

The conducted research integrates interrelated methodological concepts that implement the leading idea:

The methodological concept reflects the mutual influence of different approaches to education and their relationship with innovative pedagogical technologies in education, showing their influence on the training of a modern specialist.

The interaction of different approaches during training is carried out by approaches: systemic, synergistic, person-oriented, competence-based, and cultural.

This concept takes into account the theoretical foundations of innovative pedagogical technologies in education that affect the quality of training of a modern specialist and also offers an innovative vision of the essence of the studied pedagogical process.

The theoretical concept defines conceptual constructs and basic concepts. In particular, the concept is defined as a set of interconnected and subordinate structural and functional subsystems. This is how the majority determines the achievement of the set educational goal - to consider innovative pedagogical technologies in education and show their impact on the training of a modern specialist, to show the importance of technology in professional activity; concepts are considered as a process of formation and development of knowledge, abilities, skills, value orientations and personal qualities of future specialists, which are necessary for them to use innovative technologies in their professional activities, and the result is the readiness of future specialists to use innovative technologies - as modern technological means that provide mastering primary technological and scientific-research knowledge and skills of education seekers, formation of professional values in them, important for innovativeness in education. The technological concept includes the organizational and pedagogical principles of the implementation of the system of training future competitive specialists using innovative pedagogical technologies in education and shows their influence on the training of a modern specialist, revealing the basic conditions and stages of its implementation.

Results and Discussion

Technology is a word of Greek origin (logos - "concept", "teaching", *tehné* - "art", "craft", "science") - a form in which human intelligence is realized, aimed at satisfying the problems of existence. Technology - "a set of knowledge about methods and means of implementing production processes" (Navolokova, 2009).

Let's consider the content of innovations in education. Innovations in education consider the introduction and dissemination in the practice of education of means, innovative ideas, the process of creating management and pedagogical technologies, which increase the performance

indicators (levels) of the components of the educational process, and in this way, the education system is updated, which leads to a qualitatively new educational state. That is innovative technologies - "objectively new technologies as a result of pedagogical creativity, or known educational technologies used in new conditions" (Vovk & Matvienko, 2020).

Analysis of innovative learning technologies used in higher education institutions (innovative pedagogical technologies, information technologies, open education, technologies of artificial intelligence, machine learning, neural networks, telecommunications technologies in education, technologies of virtual and augmented reality and artificial intelligence and distance learning, humanitarian technologies, knowledge design technologies, educational robotics projects, etc.), makes it possible to present them according to a criterion such as the presence or absence of a lecture, provided that a lecture is a form of organization of the educational process. Such learning technologies are of great importance for the educational field, in which individual learning, collective learning in small groups are mandatory components, form, and main; technologies of reading a problem lecture and organizing independent activities, personal practice of a personally oriented lecture, oriented lecture, lecture-conference, etc (Biletska et al., 2021).

Let's consider interactive technologies that are aimed at intensifying activities in the education process and contributing to the development of specific subjects. This group of technologies includes: "master class" technology, game, project technologies, self-knowledge and self-assessment technologies, self-presentation, reflection technologies, etc.

A positive point is the focus of information technologies on mastering new means of search, the use of which is necessary for the processing of scientific and educational information, namely: the means of the Internet, computer equipment, audio, and video equipment. Information technologies also contribute to the formation of an informational and special environment in an educational institution, complement the communication of education seekers through modern means, and directly, intensify communication links between the subjects of the education process. In this way, it becomes possible to get an education with the help of information technologies from any location (Kuchai et al., 2021).

Communicative technologies are related to the organization of group, collective, pair, individual work and are aimed at improving communication and interaction with people. Such technologies are collective activity, communication, dialogic technologies, technologies for organizing group activities, training, etc.

From the approach to the implementation of humanistic values in education, we claim that humanitarian technologies are aimed at the implementation of such values, create various means of implementing such an educational space, ensure the formation of socially significant qualities, determine the single requirements for the development and application of solutions to educational tasks. All these technologies are necessary for all people, regardless of the level of education and professional training. Thanks to the application of technologies, the type of behavior at the level of relationships between people of different social statuses, nationalities, and cultures in families and organizations is changing (Kovalchuk & Shcherbak, 2018).

Let's emphasize the attention of the higher school to the need to use innovative pedagogical technologies that are integrated into the educational space with information and communication technologies. Technologies that integrate the project method, project learning technologies, information and communication technologies contribute to students' formation of a high level of development of creative thinking, skills, and the ability to operate with information, taking into account with this approach the development of communication skills that expand the opportunities for self-development and self-education of students, etc.

Creative cooperation between teacher and student is facilitated by intellectual partnership, knowledge design, and active activity on the part of the student. Let's highlight the factors that affect the student's effective work on the project and its successful construction:

- formation of knowledge, which is the basis for starting independent work on the project;
- presentation of new, professional knowledge that students of education receive in the process of research;
- the correct interpretation of knowledge and control over it;
- formation of skills for the professional construction of knowledge.

During the creation of the project, the student, working in small groups, acquires experience of social interaction in a creative team, uses the acquired knowledge in a specific activity, forms his idea about the principles of cooperation (independently realizes the organization of his activity, goals, introspection, self-control).

With the help of the development of social media and its services, students can communicate with each other: exchange experience and knowledge, opinions, establish contacts, interact with each other, exchange information, hyperlinks, videos, news, photos, and music. According to their features and significance, they are used in the educational process of higher education institutions. An effective tool is a blog - an Internet diary, an Internet journal of events, the content of which is images or multimedia, regular addition of records; is a Website, the main content of which is text, multimedia, images, links (called "posts"). All this makes it possible to use multimedia, create a new educational environment, expand didactic educational opportunities, and improve the quality of education (Shunkov et al., 2022).

Blogs used by teachers and students in the educational process are currently offered:

- teacher's diary: <http://dnevnik-alla.blogspot.com>;
- English language teacher's blog: <http://askorzunina.blogspot.com>;
- German language teacher's blog: <http://duotschbeinns.blog.tut.by>;
- a blog on learning English: <http://osipovateacher.blogspot.com> and others.

Web quests are of great practical importance in education, which include in their content a problematic task with elements of a role-playing game, for the implementation of which the information resources of the Internet are used.

When using the Blog Quest, as in the Web Quest, interactive communication between students is carried out. We use Web 2.0 services, the HTML language, which does not require knowledge of programming, presentation, and work with sites. Work in the Blog Quest online uses the following services: Word Press, Blogger, or My Blog. (Gurevich, 2014).

We classify innovative educational technologies by groups.

Digital technologies. They are used for the digitalization of the consciousness of education seekers, the creation of digitalization processes in society, integration of various subject areas with informatics in a professional aspect. Computer software tools are of great importance in the study of all disciplines, as a result of which, based on the use of digital technologies, a fundamental restructuring of the educational process takes place. Such an implementation increases the productivity of a specialist, improves motivation, educational outcomes form a digital culture, and is possible when disciplines aimed at studying digital technologies are included in the curriculum.

Personal-oriented technologies. Technologies that provide comfortable, conflict-free, safe conditions for the development of education seekers, put the individual at the center of the educational system, and contribute to the realization of its natural potential. Personality is the goal of a quality education system, not a means to achieve any goal.

Information and analytical support of the educational process and management of the quality of education. The use of such technology allows to objectively realize the development over time of each student of education separately, in groups, courses, and educational institutions. It is an indispensable tool in the process of preparing general control, monitoring, studying the state of teaching a certain discipline, and studying the work system (Kotiash et al., 2022).

Monitoring of intellectual development. The technology includes analysis and diagnosis of the quality of education of each student with the help of graphs of the dynamics of success, and testing. Educational technologies. In modern conditions, education is implemented in the form of additional forms of personality development: participation in student self-government, mass cultural events, etc.

Didactic technologies. Independent work, group, and differentiated learning methods can be implemented here - the "small group" system, a didactic game, project protection, learning with the help of audiovisual technical means, and the "consultant" system. Various combinations of these techniques are used (Vovk & Matvienko, 2020).

Recently, open education has gained great importance, a technology that flexibly takes place and can include distance or other forms of learning, as well as the ability to combine

elements of traditional and independent learning with an appropriate form of control, it is a system of acquiring knowledge, capable of rapid response due to group educational needs, individual, changing socio-economic situations. The goal of open education, which is based on the methodological and worldview principles of continuity and openness of the learning process, is to prepare a person for professional activity, and full and effective participation in the public life of the country in the conditions of the information and telecommunication society (Kuzminskyi et al., 2018).

The general model of open education provides for the integration of all ways of human knowledge of the world; free use of information resources; openness of education in the future; personal orientation of the learning process; integrity and interconnectedness of man, nature, and society; development of information culture development; introduction of synergistic ideas about the openness of the world into educational processes. Open education promotes a combination of learning and social experiences: from learning in the immediate environment of learning colleagues and teachers, group classes to methods that emphasize the need to develop communication skills, and group work, based on such values as access, ownership, support, participation, and convenience. The environmental approach in education is being updated, which contributes to providing effective conditions for the realization of personality directions for competitiveness, which is considered one of the most effective, multifaceted factors of personality development in the process of obtaining an education. Such innovative training contributes to changes in the social environment, and culture; focused on the formation of an individual's readiness for dynamic changes in society due to forms of thinking, the development of creative abilities, as well as the ability to cooperate with other people (Kyrychenko & Sergejeva, 2018).

Modern education is not possible without virtual and augmented reality technologies, which do not require significant financial resources and contribute to the creation of thematic visualized content that can be used by the target audience to meet certain needs with the help of modern electronic devices. There are a large number of materials and video instructions for using the technology. The majority of students have smartphones and tablets, which makes it possible to study without obstacles using augmented reality technology. At the same time, you can use a smartboard or a smart screen, for innovative

pointers. For example, the Thalmic Labs product is a special bracelet that is worn on the arm and allows the user to control the content on the screen (rotate, zoom in, zoom out, scroll, etc.) through the identification of various movements, which makes it possible to control the visualized objects that are displayed using the augmented reality (Kuchai et al., 2022).

To apply augmented reality technology, use:

1. Textbooks and manuals, using specialized objects with augmented reality technology where printed illustrations are changed into three-dimensional animated objects that can perform movements and are accompanied by sounds.
2. Developmental games activate motivation and are positively perceived by students, contributing to the assimilation of knowledge, abilities, and skills.
3. Modeling of objects and situations, construction of certain situations, and creation of graphic objects save financial and material resources and allow conducting practical classes in classrooms.
4. Applications for training the skills of students outside the educational institution for the independent practice of specific practical tasks will allow institutions of higher education to raise the quality of education to a new level. It is necessary to create specialized applications for disciplines that will represent educational and methodological complexes with 3-D stereoscopy; the development of modern NMKD using augmented reality technology (Chubukova, 2018).

Distance learning technology encourages students to continuously independent work, provides new opportunities for self-expression, is relevant and necessary, allows you to choose your rhythm of learning, forms an informational culture in students, and requires greater self-organization. This technology systematizes materials, improves the content of performing practical and laboratory tasks, provides an opportunity to acquire professional knowledge at any convenient time, and improves skills throughout life. Technology increases the motivation of the teacher, students of education, contribute to the formation of creativity and professional orientation of the individual; orients students to the formation of their methods of activity, mobilization of forces for interest during training. During such an approach to education, favorable circumstances arise for providing

digital content for educational programs (Desyatov, 2020).

According to New Media Consortium experts (Adams et al., 2017) technologies of neural networks, artificial intelligence, and machine learning that allow the creation of perfect natural user interfaces (use of natural languages, voice recognition, etc.) are of great importance for education. Artificial intelligence expands its potential for the development of online learning, so there is an opportunity to improve the adaptive learning and research processes of the software, which leads to intuitive interaction with students. Enterprise software such as Jenzabar and IBM SPSS with machine learning capabilities help higher education institutions interpret data to improve financial aid programs, reduce dropout rates, and predict future enrollment (Sysoeva & Osadcha, 2019).

Technological achievements in the field of education serve to interest students, for diversity to increase the motivation of students to study; allow using natural language, gestures, touch, and body movements for human interaction with computers or smartphones

Conclusions

The importance of the concept of "innovative technologies" is considered and shown.

The content of interactive technologies is revealed, the direction of which we see is the activation of the activities of the subjects of education in the process of their development; information technologies, which are necessary to master the means of searching, processing, and applying scientific and educational information; humanitarian technologies, which create a variety of means of education, are mandatory for the realization of humanistic values in education, are used to solve educational tasks, ensure the formation of qualities necessary for a person, his professional training; innovative pedagogical technologies that have integration with information and communication technologies; projecting knowledge, for active activity on the part of the student, creative cooperation between the teacher and the student, their intellectual partnership.

The classification of innovative educational technologies by groups has been made. The content of open education is disclosed and the general model of open education is analyzed.

The role of virtual and augmented reality technology is shown, which provides new opportunities for self-expression, encourages students to constantly work independently; technologies of artificial intelligence, neural networks, and machine learning, which allow the creation of more perfect natural user interfaces; telecommunication technologies in education to increase the motivation of students to study.

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