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Innovative educational technologies in the system of specialist's professional training[84]

Інноваційні освітні технології в системі професійної підготовки фахівців

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Abstract

The process of education development with its innovative component begins with the influence of the need for changes in the arena of the educational process in higher education. It is created during the analytical work of specialized scientific organizations, education management bodies, heads of higher education institutions, scientific and pedagogical teams. It is highlighted the main principles that show the innovative work of modernization of higher education carried out by the Bologna process. The structure of readiness for innovative pedagogical work is outlined as a combination of motivational, cognitive, creative, reflective components. These components are interconnected. The article considered the levels of formation of a specialist's readiness for innovative work. The formation of specialists' readiness for innovative work outlines the presence of various models. Attention is focused on the model of training specialists for the use of innovative technologies, which includes various interconnected components. It was found that

Анотація

Процес розвитку освіти з її інноваційною складовою починається з впливу необхідності змін на арені освітнього процесу у вищій школі. Він створюється при аналітичній роботі спеціалізованих наукових організацій, органів управління освітою, керівників закладів вищої освіти, науково-педагогічних колективів. Виокремлено основні принципи, що показують інноваційну роботу модернізації вищої освіти, яка здійснюється Болонським процесом. Окреслено структуру готовності до інноваційної педагогічної роботи як об'єднання мотиваційного, когнітивного, креативного, рефлексивного компонентів. Ці компоненти взаємопов'язані між собою. Розглянуто рівні сформованості готовності фахівця до інноваційної роботи. Формування готовності фахівців до інноваційної роботи окреслює присутність різних моделей. Акцентовано увагу на моделі підготовки фахівців до використання інноваційних технологій, яка вміщує різні взаємопов'язані компоненти. З'ясовано, що при підготовці

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when training future specialists for innovative activities, the relationship between the teacher and students should be based on certain principles. The parameters of the specialist's innovative activity are determined: the specialist's readiness to carry out innovative activity, the specialist's innovative activity, the result of the innovative work.

Keywords: innovative technologies, professional training system, specialists, education, innovative activity.

майбутніх фахівців до інноваційної діяльності зв'язок педагога зі студентами має окликатися з певними принципами. Проаналізовано погляди різних науковців щодо означеної проблеми. Визначено параметри інноваційної діяльності фахівця: готовність фахівця до здійснення інноваційної діяльності, інноваційна діяльність фахівця, результат інноваційної роботи. Зазначено, що особливість інновацій у вищій освіті схиляється до того, що вони: завжди мають нове рішення нагального питання у галузі вищої освіти; їх застосовування викликає спроби до новітніх звершень освітньої діяльності; їх здійснення викликає високі зміни в протилежних складових єдиної системи вищої освіти.

Ключові слова: інноваційні технології, система професійної підготовки, фахівці, освіта, інноваційна діяльність.

Introduction

Under the conditions of educational reforms, innovation activities aimed at introducing various pedagogical innovations have acquired particular importance in education. They covered all aspects of the didactic process: the forms of its organization, the content and technologies of education, educational and cognitive activities.

Innovative technologies of modern education (late XX – early XXI century) are charted by the important ideas: traditional (mastering basic knowledge, skills and abilities; learning and understanding academic facts), rationalistic (relying on facts as an ordered set of impartial facts based on the formation of an real and widely developed technology) and humanistic (a necessary condition for personal self-expression, self-affirmation of a person, the ability to most fully and adequately correspond to the nature of the human "I") (Dubasenyuk, 2009).

One of the ways to improve the efficiency of the education system is the introduction of various innovative activities. The process of introducing innovations in the field of education is an improvement of the content, methods, means, pedagogical technologies, which certainly affects the quality of the educational process.

Innovative activity affects the increase in the level of professional competence of the teacher, intensifies his desire to acquire new knowledge, self-realization, to improve his qualifications, to self-expression, to the development of creative abilities.

The implementation of innovative technologies into the education process improves the adaptation of the learning process to the psychological characteristics of the modern student generation. Currently, the formation of practical skills, an active and independent role in education, the use of various innovative technologies and their implementation in practical activities is an urgent issue.

Innovative activity is a practical activity related to the development of a wide range of innovations: new competitive types of products, modern technologies, alternative resources, effective organizational forms of production and management, as well as emerging markets in enterprises, industries, regions and countries

As a branch of pedagogical science, innovation studies the process of updating educational activities, its principles, patterns, means and methods. Pedagogical innovation is aimed at introducing innovations into the learning environment that improve the characteristics of both individual components and the educational system as a whole.

In this article, we will consider the quality of educational innovations, the principles that establish an innovative focus on the modernization of higher education. We have identified the goals and objectives of the innovative development of education, as well as the stages of creation, dissemination and development of innovations.

When preparing future specialists for innovative activities, we considered the components and principles for the use of innovative technologies; determined the parameters of the innovative activity of a specialist, and also considered different forms of innovation.

The purpose. To reveal the content and significance of innovative educational technologies in the system of professional training of specialists.

Literature Review

O. Bartkiv (2010) claims that the formation of specialists' readiness for innovation activities implies the availability of appropriate models. One of the existing models in modern science and practice is the model of training specialists to use innovative technologies.

I. Dychkivska (2004) considered the construction of readiness for innovation activity as a set of motivational, cognitive, creative, reflexive mechanisms that are mutually conditioned and related.

T. Kravchenko et al., (2022) focus the structures of the recent education system in Poland, exposes the distinctiveness of refining the professional competence of a specialist in Poland over the operation of multimedia technologies.

O. Plakhotnik et al., (2022) explain the position of multimedia teaching tools is shown, which are capable and extremely operative tools that let the educator not only to present an array of material in a greater size than traditional foundations of information, but also to contain text, graphs, diagrams, sound, animation, video, etc. in a visually integrated form.

O. Shchyrbul et al., (2022) demonstrate the essence of the idea of multimedia. In the situation of media education, multimedia lists a number of purposes: informational, interpretive, cultural, entertainment, and educational.

O. Voloshyna (2014) highlighted the main principles that determine the innovative direction of modernization of Higher Education, which is carried out in line with the Bologna Process and the principles of innovation activity of a specialist: the principle of combination of education, the principle of differentiation and individualization of education, the principle of democratization of teaching.

O. Dubasenyuk (2009) analyzed innovative educational skills and approaches in the system of qualified and didactic training of specialists. She considered the criteria for pedagogical innovation.

I. Artiomov (2016) proved that the experience of developed countries testifies to the power of the catalyst for attracting business entities to innovation activities that the main factor in this is the system of institutions of infrastructure support for innovation activities.

S. Koda et al., (2022) show that scientific investigation goals to examine the dynamics of the operation of methodical and technological modernizations in the multicultural educational environment over the actualization of distance learning.

E. Kovshar et al., (2019) light up in their article the classifies creative technology as a set of interactive learning tools, which permits students and teachers to make personal educational products of knowledgeable discovery: project, invention, design, presentation, task, hypothesis, etc.

I. Barba et al., (2021) considers the position of researchers on the idea of "pedagogical technology", classifies the signs of pedagogical technology and present classifications, reflects non-traditional (innovative) learning technologies, as well as their real forms of application in the educational process, reviews the results, makes approvals for the practical application of the studied material.

O. Dovgal et al., (2021) regard the development of introducing something innovative into life, and in our case, into the educational development.

V. Kryvoshein et al., (2022) show the innovative Educational Skills in Organization Training: Practice of EU Countries.

O. Komar et al., (2021) show the possibility of using and actively realizing advanced skills in the practice of forming the educational process.

O. Khallo et al., (2022) examined the descriptions "innovation", "technology", "pedagogical technology", "Innovation pedagogical technology" and the important role of innovation in education.

L. Castañeda, & B. Williamson (2021) suggest a demonstration of the results of the evaluation and

organization of scientific information on the theoretical basics of the development and application of educational technologies in universities.

F. Rashidovna & S. Nurkabilovna (2022) presents advanced technologies in the management of preschool education, innovative organization and its values, the construction and problems of the innovation process, the need for innovation.

L. Shevchenko et al., (2021) light up the training of educators for advanced training activities.

Y. Li (2017) expound the big data and its central meaning of educational technology and novelty countermeasures of educational technology from the perspective of big data.

O. Galynska et al., (2021) in the article presents an study of innovative teaching skills as a method to rise students' competitiveness.

Methodology

Typically, the formation of innovative potential in order to ensure the effective innovative activity of the company is associated with the need to solve the most difficult methodological, and in some cases methodological problems. Innovative activities, on the one hand, requires management, labor collective and employees of the enterprise separately of additional efforts that they are not characteristic of regular situations. Such additional expenses of time, resources and effort are not compensated in any way, at least at the stage of initiation of innovation. It means that the highest management of the enterprise should create special organizational forms that would provide any other, not quite traditional incentives for the implementation of innovative activities. But, on the other hand, by nature, innovative activity leads to the deepening and expansion of diversification of the company's economic portfolio, and this inevitably complicates its organizational and production structure.

The general methodology of the research is based on the philosophical provisions of the theory of cognition, general scientific principles of science, historicism, integrity, cultural correspondence, unity of national and human; conceptual provisions of philosophical, psychological, pedagogical, economic sciences on human orientation to self -improvement.

The methodological level is based on the following scientific approaches: synergistic approach contributes to the enrichment of the educational process with dialogue and methods of educational and pedagogical interaction, which ensures the development of students and teachers; a systematic approach according to which the education and upbringing of a child is a system in which all components are interrelated and interdependent; the advance approach contributes to the fundamental of future teachers training, their focus on innovative professional activity; the cultural approach is aimed at implementing the educational process, taking into account the culture and historical traditions of their people, which permeates all pedagogical activity; the technological approach makes it possible to ensure the effectiveness of theoretical and practical training of specialists in universities.

We have used the following scientific search methods: theoretical (analysis of philosophical, sociological, historical, pedagogical, psychological literature), which made it possible to substantiate the initial provisions of the study; interpretation-analytical method, on the basis of which Ukrainian and foreign sources were studied with the use of synthesis, analysis, systematization and generalization; empirical (observation, analysis of results of activity) in order to identify the level of training of specialists in the Higher School of Ukraine; specific scientific (analysis and generalization of modern foreign approaches to the organization of professional training of a specialist): comparative-historical analysis (comparison of phenomena within the region); semantic-terminological (substantiation of the conceptual and terminological apparatus of research); search (formulation of conclusions, identification of progressive ideas in education systems from different countries); statistical; the method of comparative-historical analysis, which made it possible to identify trends in the development of pedagogical education in other countries of the world.

Results and Discussion

The specificity of innovations in higher education is because they, firstly, always contain a original answer to the current problem in the field of Higher Education; secondly, their use leads to qualitatively new results of educational activities, and thirdly, their implementation causes qualitative changes in other components of the unified higher education system.

Educational innovations differ in the qualities that are laid down in them even during their

development. These qualities include the following:

- the subject of changes, that is, the element of the higher education system that can be transformed;
- depth of transformation (the degree of radical changes that involve the application of innovations);
- scale of transformation in the field of Higher Education;
- resource intensity of innovations;
- level of development.

The main principles that determine the innovative orientation of Higher Education modernization, which is accepted in line with the Bologna Process, are:

1) transition to a two-level training system;
2) revision of the content of the main educational programs in agreement with the necessities of the Ministry of Education and Science of Ukraine and their presentation on a modular basis;
3) operation of the competence approach in the content and process of Education;
4) introduction of a point-based rating system for assessing and controlling the quality of education instead of a five-point one.

Consistent innovation of the higher education structure in these areas involves shifting the focus from the education process to its results, changing the role of the teacher, a personal approach to the student with ensuring its productive cognitive activity. These measures require essential transformations in all parts of the educational system: in the values, purposes, content, process and results of training and education, in the nature of teachers and students' activities.

In fact, we are talking about the real enactment of a new educational model, about the transition to a new type of education and training, about providing each institution of higher education in Ukraine with such a quality of education for graduates that would meet the challenges of the time. In fact, we are talking about a deep reform of Education.

The transition of a higher education institution in Ukraine to the mode of innovative development as a strategic goal implies the implementation of certain intermediate goals:

1) formation of a single cultural, educational and scientific space of higher education institutions;
2) creating an effective competence-contextual educational model of Bachelor's and Master's degree training;
3) involvement of the entire staff of higher education institutions in the innovation process;
4) systematic modernization of educational activities;
5) establishing business relations with state authorities, educational and scientific institutions, employers, and public organizations;
6) implementation of coordination programs with Ukrainian higher education institutions-partners in innovative development;
7) expansion of international cooperation programs.

To achieve these goals, you need to solve the following tasks:

1) creation, realization of the program and implementation of the strategic goal;
2) development of scientific bases for modernization of educational and scientific activities of higher educational institutions;
3) creation and implementation of a competence model of multi-level professional training of students in higher education institutions;
4) transition to a credit-modular organization of the educational process;
5) development of a mechanism for quality control of professional training based on a point rating system.

Innovative change of higher education is the process of modernizing education through the creation, dissemination and assimilation of innovations. This cyclical process goes through the following stages:

- identifying change needs (identifying a problem);
- development of an idea for solving the problem;
- development of a way to solve the problem (innovation);
- approbation and skill of innovations;
- assimilation of innovations;
- institutionalization of innovations.

The modernization development begins with the identification of the need for changes in positive parts of the educational process in higher

education, which occurs due to the systematic work of focused scientific organizations, educational management bodies, heads of higher education institutions, scientific and pedagogical teams.

Developing ways to solve a problem is designing an innovation. The developed innovation must pass experimental testing, because of which adjustments can be made to it. Before an innovation reaches the stage of distribution, it must pass an expert examination, that is, an assessment of its compliance with specific requirements.

Spreading an innovation requires replicating it and communicating information about it to potential users. Distribution is facilitated by the availability of a special infrastructure to support innovative educational processes. It includes various consulting services, training centers, experts, implementation centers, etc.

The main stage of the innovative process of training specialists takes place in higher education institutions. The need to search for and assimilate specific innovations arises when the management of an institution or research and teaching staff has found shortcomings in educational activities and analyzed their causes. After that, the innovation can either be developed in the institution of higher education itself (this will be the beginning of the first stage of the innovation process), or it can be selected from existing innovations, the use of which will increase the effectiveness of educational activities. The great importance is the teacher's readiness for innovative professional activities (Voloshyna, 2014).

O. Oseredchuk et al., (2022) show, that educational innovations, like any other innovations, create problems related to the need to combine innovative programs with state programs of education and training, the coexistence of various educational concepts. They require fundamentally new methodological developments, a new quality of educational innovation. These innovations are hindered by the non-compliance of new types of educational institutions with the requirements of parents, who mostly focus on traditional standards of education and training.

No less acute are the difficulties of adapting innovations to new conditions. Often they are caused by attempts to adapt to specific conditions educational technologies elements of the content of education and training that have proven effective in other areas, or concepts developed in completely different historical conditions. Such mechanical transfer leads to the loss of the content and deep essence of innovation, which often leads to its discrediting.

Dychkivska notes that the structure of readiness for innovative educational actions is considered as a set of motivational, cognitive, creative, reflexive components that are mutually conditioned and related (Dychkivska, 2004).

The cognitive component combines the traditional information of a specialist about the spirit and details of innovative educational skills, their types and structures, as well as a set of skills and abilities for applying innovative educational technologies in the structure of their own professional activities, associated with readiness for research activities. It is characterized by the amount of knowledge (depth, consistency), thinking style, and formation of skills and abilities of a specialist.

The creative component is realized in the original answer of educational problems, in improvisation, unplanned; it is manifested through openness to educational innovations; flexibility, critical thinking; creative imagination. Its importance is generated by the creative nature of innovation activities.

The reflexive component characterizes the specialist's cognition and analysis of the phenomena of one's own consciousness and activity. This element is implemented over such impulsive processes as self-understanding and understanding of the other, self-assessment and assessment of the other, self-interpretation and interpretation of the other.

Let us consider the levels of readiness for innovative educational activities.

There are, based on the manifestation of the above qualities, intuitive, reproductive, search, creative (productive) levels of formation of readiness for educational innovations.

Instinctual level of readiness for innovative educational activities. This level of readiness formation includes specialists who, according to the peculiarities of thinking and practical activities, treat novelty questions as an alternative to traditional training. The basis of their activity in this case is an emotional, intuitive attitude to the perception of new things because they are new, and not a deep theoretical knowledge of the features of an innovative idea

or an analysis of the practice that is based on this idea. Their reflection is not formed.

Reproductive level of readiness for innovative educational activities. Specialists belonging to this category are well aware of the theoretical foundations, content, and specific methods of innovative specialists, and often use elements of these systems in their own activities. However, the use of innovations in their practice is unsystematic (disordered), situational. Some experts believe that their authors can only apply the latest technologies. Their reflection is not sufficiently expressed.

Search level of readiness for innovative educational activities. Specialists of this group attempt to work in a new way, embodying well-known skills and methods of educational work in their own activities. They are prepared to experiment, do not hide their successes or mistakes, and are open to public debate and understanding of educational innovations.

Creative level of formation of readiness for innovation activities. Specialists of this level are creative in innovative activities, have meaningful knowledge about new scientific and innovative methods to teaching and educating, own the latest skills and make their own. The realization of creative potential in the innovation process is the most important reference point for many of them.

Knowledge of the level of formed readiness of each specialist for innovation activities allows both the specialist to plan their self-development, and the head of the school to adjust the innovative potential of the team, which is an important component of structural professional qualities.

The formation of specialists' readiness for innovation activities implies the availability of appropriate models. One of the existing models in modern science and practice is the model of training specialists to use innovative technologies, which includes the following interdependent components:

a) awareness of innovative educational technology by:

– mastering the content and methodology of innovative technologies;
– mastering the technology of developing and applying innovations;
– determining a personal position on the need to use innovative technologies in practice;

b) technologization in the formation of competence of specialists in the development and use of innovative technologies;
c) effectiveness of teacher training for the use of innovative technologies and its assessment.

When preparing future specialists for innovative activities, the teacher's interaction with students should comply with the following principles:

– continuity and integrity of personal development, harmonization of activities, integration of all its aspects;
– personal orientation;
– professional and practical orientation;
– alternatives, freedom of choice;
– awareness of professional and personal development during educational interaction;
– creative self-expression, collaboration and co-creation (Bartkiv, 2010).

The following parameters of a specialist's innovation activity are defined:

1) Readiness of the specialist to carry out innovative activities.
2) Innovative activity of a specialist.
3) Effectiveness of innovation activities.
4) Each activity parameter is detailed with certain indicators.

The parameter "The readiness of a specialist to carry out innovative activities" is revealed by the following indicators:

– ability to self-organize;
– ability to introspect, reflection;
– ability to abandon stereotypes of thinking;
– striving for creative achievements;
– critical thinking, ability to make value judgments.

The following indicators characterize the «Innovation activity» parameter:

– variability of activity;
– mastering the methodology of creative activity;
– knowledge of research methods;
– ability to accumulate and use the experience of creative activities of other specialists;
– ability to cooperate and provide mutual assistance.

The following indicators reveal the «Performance» parameter:

- creation of the author's idea of teaching and educating;
- development of the content of plans and programs; methods, technologies;
- testing of innovations;
- dissemination of educational innovation;
- identification of an innovative initiative.

Various forms of attracting a specialist to innovation activities include:

- organization of a permanent scientific seminar on the most pressing problems that teachers of an educational institution are working on;
- position of specialists at research institutes and institutions of Higher Education;
- educational assemblies, round tables, debates;
- business, heuristic games for generating new pedagogical ideas;
- creative activity of specialists in methodological associations;
- involvement in methodical and practical discussions;
- overview of their own experience and the experience of their colleagues;
- classes at different advanced training courses;
- independent research, creative work on the topic, problem;
- participation in collective experimental research work within the framework of a common problem that teachers of an educational institution are working on.

The strategy of innovation activity of the teaching staff, individual teachers in each specific situation has its own time limits, depending on the scale of innovation, on how much time and what human, organizational, material and financial resources it requires. However, most importantly, the innovative activity of specialists is the basis for updating educational institutions, creating a qualitatively new practice – an author's institution or a radical reform of the entire educational system.

Innovative activity of a specialist involves compliance with the following principles: 1) The principle of education integration. 2) The principle of differentiation and individualization of Education. 3) The principle of democratization of Education.

An innovation specialist should be able to implement:

- humanism (trust in pupils, deference for their character, pride, sureness in their abilities and capabilities; feeling of changes in the values of education: not the assimilation of formal knowledge and skills, but the humanity of relationships, freedom of expression, cultivation of individuality, creative self-realization of the individual);
- empathic understanding of pupils (the desire and ability to feel the other as yourself, understand the inner world of pupils, perceive their positions);
- cooperation (regular change of pupils into co-creators of the educational process; knowledge of communication culture);
- dialogism (ability to listen, be interested in opinions, develop interpersonal dialogue based on equality, shared understanding and co-creation);
- personal position (creative self-expression, in which the teacher seems before students as a person who has his own opinion, is open in the manifestation of his spirits, reactions; improvement in his profession – the acquisition of various competencies, etc.) (Voloshyna, 2014).

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The measures are aimed at clarifying the tasks and functions of executive authorities and local self-government in the innovation sphere and providing legal bases for the creation of structural divisions by local state administrations on innovative development issues. A number of measures are aimed at creating favorable conditions for the activation of innovation activities, the introduction of innovations, the functioning of innovation infrastructure. In addition, the market of innovations and technologies by improving the legal basis for the functioning of technology parks, promoting the creation and functioning of technology platforms, simplifying the procedures for the formation of innovation clusters, small innovative enterprises (Artiomov, 2016).

Conclusions

The main goal of modernizing the higher education system is that the effectiveness of higher education can be improved by designing and implementing the latest educational systems and technologies. The structure of readiness for innovation activity is measured as a set of motivational, mental, creative, reflexive components and the level of formation of a specialist's readiness for innovation activity. It is

highlighted as one of the main models of training specialists to use innovative technologies. It was found out that when preparing future specialists for innovative activities, the teacher's interaction with students should comply with the following principles: continuity and integrity of personal development, harmonization of activities, integration of all its aspects; personal orientation; professional and practical orientation; alternative, freedom of choice; awareness of professional and personal development during interaction; creative self-expression, cooperation and co-creation. The parameters of innovation activity of a specialist are determined and the forms of attracting a specialist to innovation activity are highlighted, and the principles of innovation activity of a specialist are written out. We see prospects for further research in studying the experience of developed countries in introducing innovative educational technologies into the system of professional training of specialists.

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