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USING NETWORK-BASED EDUCATIONAL AND METHODOLOGICAL COMPLEXES IN PROFESSIONAL TRAINING OF FUTURE LECTURERS

Tetiana Kryvorot[1], Mykola Pryhodii[2]

1 Candidate of Pedagogical Sciences, Senior Research Officer at the Laboratory of Electronic Learning Resources of the Institute of VET of NAES of Ukraine
   http://orcid.org/0000-0002-4267-077X, e-mail: tania.krivorot@gmail.com

2 Doctor of Pedagogical Sciences, Full Professor, Head of the Department of Industrial Engineering and Service of M. P. Drahomanov National Pedagogical University
   http://orcid.org/0000-0001-5351-0002, e-mail: prygodii@ukr.net

Abstract.

Relevance: Given today's development of society, networks are implemented in many industries, the education system being no exception. The use of network-based technologies is an important stage of student learning in teacher training institutions. The development of Internet technologies opens new ways of introducing distance technologies and requires high-quality network-based educational and methodological support.

Aim: The paper aims to justify and reveal the results obtained from experimental verification of the author's methodology for using network-based educational and methodological complexes in professional training of future lecturers.

Methods: Analysis, systematization and generalization; observation, surveys and questionnaires; experiment, methods of mathematical statistics (Pearson's chi-squared test (?2)).

Results: The paper deals with the problem of an educational environment based on advanced information and communication technologies (ICT) with the use of Internet technologies. It reveals the didactic potential of network-based resources in increasing the efficiency of the educational process. It proves that the use of network-based educational and methodological complexes is effective for enhancing learning and cognitive activity of students. It specifies the concept, structure and content of network-based educational and methodological complexes. It justifies the prospects of its use, as well as the focus on activation, individualization and innovation of the educational process. It considers methodological issues of improving the quality of educational services with distance technologies. It clarifies the features of creating network-based educational and methodological complexes and presents theoretical principles of selecting and structuring educational materials and their brief description. It presents the author's network-based educational and methodological complex "The Fundamentals of Scientific Research" on the Moodle platform, which consists of the organization and information block, the operations and activities block, the motivation and communication block, the evaluation block.

Conclusions: The paper describes the criteria, indicators and levels of assessing future lecturers' training and presents the results from experimental research on the validation of the network-based educational and methodological complex. It proves that the differences between the control and experimental groups (CG and EG) are statistically significant, which confirms the effectiveness of the proposed methodology.

Keywords: *network-based educational and methodological complex, information and communication technologies, educational environment, training programme, future lecturers.*

Introduction. The elaboration of any educational course is followed by the creation of an educational and methodological complex. The latter is a set of regulatory, educational and methodological materials necessary for implementing the working programme of the course. Still, educational courses are introduced not only to master the basics of sciences but also to achieve certain expected learning outcomes, manifested in the competencies students must obtain during the training. Thus, the content, forms and tools of learning can and should change according to individual training. Under such conditions, the educational and methodological complex as a set of regulatory documents is a certain constraining factor in the effective professional development of future specialists (Pryhodii, 2019).

The adaptation to international standards and modern information and communication environment urges educational institutions to introduce innovative forms, tools and methods of organizing the educational process. More and more educational institutions seek to develop and implement educational and methodological complexes focused on the use of the Internet in the practice of their educational activities, as well as develop and maintain the elements of distance learning. Electronic educational and methodological complexes combine electronic educational services and resources with the help of ICT. It allows one to organize both individual and group training in compliance with the requirements and recommendations of the programme.

The process of creating such complexes aims to update educational space, improve the content of training, make the educational process more accessible, regardless of place, time and form of education, and provide future specialists with high-quality educational and methodological materials. ICT can be used for creating, transferring and storing educational materials, organizing and supporting the educational process through local and global networks. The basis of electronic educational and methodological complexes is a block of educational and methodological support. It contains educational and informational materials; scientific reference information; activity-oriented, communicational and monitoring components; auxiliary resources. They can be placed both in the internal network of educational institutions and global Internet networks.

Given the today's development of society, networks are implemented in many industries, the education system being no exception. The training for using network-based technologies is an important stage of student learning in teacher training institutions. Its effectiveness increases with the use of network-based educational complexes, as well as organizational and methodological support, within which network-based educational complexes should also become an object of study. The development of Internet technologies opens new ways of introducing distance technologies in higher education and requires high-quality network-based support.

Sources. The problem of creating educational e-resources for professional training of future lecturers is rather topical. However, it can be solved by organizing the educational process based on informational educational resources. Many scholars have covered the issue of education informatization in their works (O. Andreiev, A. Hurzhii, A. Kolomiiets, M. Leshchenko, O. Ovcharuk, Yu. Ramskyi, O. Spirin, I. Tsidylo, A. Yatsyshyn, M. Zhaldak). At the same time, O. Burov, V. Bykov, K. Kolos, T. Koval, V. Kukharenko, S. Lytvynova, N. Morze, L. Panchenko, S. Semerikov, M. Shyshkina, Yu. Tryus have paid much attention to the use of computer-based educational environments. V. Bespalko, N. Borysova, V. Hura, Ye. Isaiev, L. Kharchenko, O. Klochko, O. Mykytiuk, N. Olefirenko, N. Samoilenko, I. Sokol, A. Striuk, T. Sushchenko, O. Uvarov, N. Yakovlieva have analyzed the issues of designing and using electronic educational resources. It must be noted that these researchers indicate high efficiency of using ICT in the educational process.

The paper aims to justify and reveal the results obtained from experimental verification of the methodology for using network-based educational and methodological complexes in professional training of future lecturers.

Research methods are the following: analysis, systematization and generalization of scientific-pedagogical and methodological literature on the problems of distance and electronic learning; systematization of theoretical knowledge about educational ICT; analysis of pedagogical experience in implementing network-based complexes in higher education institutions (HEIs); observation used to identify future lecturers' readiness to use network-based educational and methodological complexes; surveys and questionnaires used to study the attitude of students and research and teaching staff towards using network-based technologies; experiment used to assess the effectiveness of using network-based educational and methodological complexes in professional training of future lecturers; methods of mathematical statistics used for qualitative description of the obtained quantitative results.

Results and discussion. The informatization of education, as well as the development of global Internet networks, makes changes in the traditional educational process. Consequently, e-learning and distance learning are gaining popularity, and the development of

network-based technologies contributes to generating a single information space. The scientific and pedagogical practice of applying ICT shows that the implementation of the educational process under network-based educational and methodological complexes is a thorny issue today. It needs research since the problem of creating and using network-based educational and methodological complexes in professional training of future lecturers has not been sufficiently studied. The relevance of the research lies in identifying and overcoming the contradictions between society's demand for network-based technologies and ineffective training of future lecturers for using them; the need to use network-based educational and methodological complexes and the availability of the justified methodology for their use; the need to create network-based educational and methodological complexes and the lack of effective models for realizing this process.

The network-based educational and methodological complex is an electronic educational resource. It contains theoretical, educational, methodological, laboratory and practical material for each content-based module. Such modules include a system of interim and summative assessment and are developed in one of the freely available distance learning systems. The complex must meet educational standards, curricula and programmes, and its structure should be based on the credit-module system. The main components of the network-based educational and methodological complex are the programme and information block, the instruction and methodology block, the control block.

The development and implementation of modern electronic educational resources, digital educational resources and educational web resources in the educational process increases the effectiveness of learning only due to the visualization of educational material, interactivity, free access to knowledge sources, timely monitoring and assessment of results. The network-based educational and methodological complex contains a full set of educational and methodological materials. Also, it can ensure support for principal and distance learning and provides students with the necessary reference information which improves the quality of the training. Finally, it creates tools for expanding and reinforcing the educational and methodological facilities of HEIs. The advantages of network-based educational and methodological complexes include the following: various ways of presenting educational material (students' immersion in the educational process, taking into account their characteristics and ability to adjust the pace of processing learning information, determine time limits for each topic, choose the level of complexity); interactivity and multimediality; monitoring of the obtained knowledge; the opportunities to search for the necessary information through keywords in the e-reference books accurately and quickly; the presence of management elements (the opportunity to repeat video information and audio recordings).

It is essential to conduct a preliminary analysis of their resources for creating educational influence and determine the peculiarities of their perception and use by the participants in the educational process to introduce ICT into this process. The dissemination of electronic educational resources is an indicator of reforms in the education system, which are rapidly occurring in the developed countries (Hurzhii &Lapinskyi, 2014).

The advantage of organizing the educational process based on informational and educational systems is the possibility of implementing personality-oriented learning, collaborative learning, multilevel and variable learning, modular and rating technology of learning and self-study (Halahan, 2015).

The network-based educational and methodological complex is a specially organized virtual learning environment, within which the individual and the collective educational process takes place. Also, it involves information support from the lecturer and the network-based connection between all users for communication and joint learning activities in the network-based environment. Its components can be educational (scientific) software, platforms for automated test check, electronic libraries, social networks, as well as distance and mobile learning technologies.

The important features of network-based educational and methodological complexes focused on professional training of future lecturers are free access; user-friendly functional and technical characteristics; an option to choose a level of complexity; feedback; prospects for improvement and integration with several other courses; mobility; observance of ethical norms. Given today's conditions of the information society, future lecturers need to be able to combine professional skills with communication ones. Therefore, the use of network-based technologies can take the interaction between lecturers and students to another level. In turn, it allows developers to model and activate the educational process based on its goals (Vdovychyn, 2015).

Thus, the network-based educational and methodological complex can be considered as a technically structured system of educational and methodological materials with a customized communication environment which involves implementing the educational process, combining the

capabilities of lecturers with the global information environment; the availability of information; the interaction between all participants in the educational process. Network-based educational and methodological complexes incorporate all traditional forms of learning in HEIs (lectures, practical classes, laboratory work, consultations, thematic surveys, tests), present educational materials in an accessible form (following the content and methods of teaching and learning), assist in solving certain problems, check tests automatically and reflect the level of educational material acquisition in grade books.

In the context of future lecturers' professional training, the network-based educational and methodological complex should create conditions for personal development of the student as the subject of educational and future professional activities, who can take independent decisions under uncertain conditions, develop his or her ability to meet information needs in professional activities, provide tools for effective use of local and global information resources by students and generate an informational and pedagogical environment (Oleksiuk, 2004).

The introduction of network-based educational and methodological complexes expands educational space, puts forward new requirements for the process of mastering knowledge, skills and abilities and takes into account the needs for personal development. The use of such resources can be more effective if students develop their moral and ethical skills of using network-based communication, as well as their ability to critically evaluate electronic information resources. It must be noted that network-based educational and methodological complexes can improve the cooperation of all participants in the educational process. An important prerequisite for their use is the advanced training of research and teaching staff (Vdovychyn, 2015).

The author of the paper has organized and conducted surveys and questionnaires among students, research and teaching staff from M. P. Drahomanov National Pedagogical University to determine the current conditions of using network-based educational and methodological complexes in HEIs. The results of these surveys show the following: the vast majority of participants believe that the use of network-based educational and methodological complexes in HEIs is appropriate and timely. It proves that the participants in the educational process are aware of the importance of network-based education in professional training of specialists, intellectual development, as well as the modernization of the educational process.

The network-based educational and methodological complex represents a set of didactic means and methodical actions. It also reflects the specifics of teaching every educational course based on modern

computerized educational programmes and implements the following principles (Buinytska, & Kaminskyi, 2012):

systematicity – the compliance with educational standards and programmes; the completeness of the course content; consistent learning; the use of different types of classes and assessment forms;

visualization – the identification of the effectiveness of multimedia materials, taking into account the peculiarities of students' perception of information;

accessibility – different complexity levels of theoretical educational material and the depth of its study, taking into account age and individual psychological characteristics of students;

consolidation and awareness – full comprehension of the acquired knowledge; the development of autonomy when choosing didactic materials; the understanding of training goals;

scientificity – the development of scientific worldview in students using general and special methods of cognition.

It must be noted that the network-based educational and methodological complex should meet the requirements of higher education standards and comply with the regulations of educational institutions. The integral structure of the network-based educational and methodological complex can consist of the following components:

1. The programme and information component (some information about the course, the academic degree for which the complex was created, the programme of the course).

2. The instruction and methodology component (thematic sections; content-based modules consisting of lectures, practical and laboratory works, methodical materials, individual and independent works, reference lists and electronic sources).

3. The control component (tasks and tests; a list of exam or pass/fail exam questions),

4. The instruction and research component (topics of reports, research tasks, term papers or dissertations).

5. The communication component (a chat in the e-course; notifications to personal e-mails).

When creating network-based educational and methodological complexes, one should take into account the modern areas in the development of education, comply with the requirements of educational standards for relevant academic degrees, optimize the content and scope of educational content, use different forms of learning and different types of classes and diversify assessment forms. The network-based educational and methodological complex should be adapted to inquiries and individual capabilities of students and be integrated concerning other courses according to the chosen profession. It is essential to use electronic textbooks while presenting theoretical

material since they contain materials in a format convenient for study and are supported by various readers and portable devices (smartphones, laptops, personal computers). Based on the method of communication between students and lecturers, the network-based educational and methodological complex can be an interactive or automated software tool. Lecturers conduct distance consultations for students in an interactive format. The complex models the "student-lecturer-student" communication in an automated format, using a computer system.

Software development of network-based educational and methodological complexes involves selecting computer tools, compiling and designing various materials to organize the educational environment and use programmable structural elements (Kademiia, 2020).

It is also expedient to study and experimentally verify the author's methodology of using network-based educational and methodological complexes in professional training of future lecturers. The current conditions of using network-based complexes require that an algorithm of interaction between all participants in the educational process should be improved. The author of the paper has developed the network-based educational and methodological complex "The Fundamentals of Scientific Research", in which independent work of students serves as the principal activity. As far as self-study is concerned, the complex provides high-quality educational content and includes materials of different complexity levels, test tasks for self-control, sets of tasks. Using it, students can independently study the course, determine, improve and control their ratings, save time. The lecturer's activity involves advising and supervising. By registering in the system, students gain access to educational material and can start working wherever there is free access to the Internet.

The network-based educational and methodological complex "The Fundamentals of Scientific Research" is hosted on the Moodle platform. The main advantages of this environment are accessibility (the platform is free of charge and freely available), long-term and multiple use, adaptability and possibility of interacting with other platforms. Moodle meets the standards of information education systems and can be adjusted to the characteristics of educational inquiries and projects. An important component of Moodle is communication. Students can communicate with lecturers, as well as with each other through public and private forums, chats, e-mail, file sharing.

The network-based educational and methodological complex "The Fundamentals of Scientific Research" has been created as a separate course, which consists of blocks arranged in a convenient order. The main page contains information about the author, the name of the complex and the content of the course. The complex includes an abstract of the course; lectures; electronic textbooks; practical, laboratory and independent classes; test tasks; topics of research and individual tasks within the course; requirements for their implementation; the list of pass/fail exam questions; a short glossary. Such multifunctionality *(see Table 1)* of the network-based educational and methodological complex makes it possible to organize learning and cognitive activities of future lecturers.

The analysis of scientific and methodological sources has made it possible to develop a structural (four-block) model of using network-based educational and methodological complexes in professional training of future lecturers. The organization and information block suggests updating the content of the course "The Fundamentals of Scientific Research" using interactive and multimedia capabilities of network-based technologies. The operations and activities block diversifies educational forms and methods with the help of computer training programmes and simulators. The motivation and communication block enables both general and individual interaction between students and lecturers to support and increase the activity of

Table 1

The realization of functions performed by the network-based educational and methodological complex

Function	The realization of functions in professional training of future lecturers
Organizational	Providing a wide range of learning and research activities
Informational	Providing students with new knowledge (this function is realized by a system of educational electronic courses, access to local and global information resources, whose tasks are included in educational materials (texts, audio, video))
Operational (activity-related)	Incorporating open electronic educational environments, computer training programmes, simulators, constructors
Motivational	Cultivating an active attitude towards learning in students through the computerized learning system
Communicational	Ensuring the communication between all participants in the educational process in HEIs
Evaluative	Providing software tools for testing and assessing students' knowledge and skills

the educational process. The assessment block controls and identifies how well future lecturers have acquired educational material.

The educational course is based on lectures, practical classes, laboratory work and independent study of educational material. Students had the opportunity to know and evaluate the features of distance learning under the Moodle platform in the course of classes. The key elements of success are well-developed material and technical resources and high-quality educational and methodological content. However, the validation of the network-based educational and methodological complex required pedagogical experiment to verify its effectiveness in achieving the set goals, identifying disadvantages and determining organizational, methodological and semantic mistakes.

The network-based educational and methodological complex "The Fundamentals of Scientific Research" has been validated by assessing the didactic and methodological content, the structure of the presented material, the implementation of technical characteristics and the expediency of using certain multimedia and interactive tools. The creation of the network-based educational and methodological complex aimed not only to improve traditional methods of teaching and learning using ICT but also to intensify the study of the course. Therefore, it was accompanied by testing and assessing the acquired material, knowledge and skills within the course "The Fundamentals of Scientific Research". The network-based educational and methodological complex ensures a close interconnection between the theory, practice and assessment of results, which allows providing the main didactic cycle of the course and implementing an integrative approach to studying professional courses by future lecturers. Such conditions help educators to model classes under the goals and needs of the course.

The pedagogical experiment was conducted throughout 2019 and involved more than two hundred students. At the beginning of the experiment, an experimental group (112 students) and a control group (107 students) were formed at the premises of M. P. Drahomanov National Pedagogical University to determine the impact of the proposed methodology. The ascertaining stage of the experiment included checking students' knowledge with the help of test tasks and surveys on the problem of organizing and conducting the educational process using network-based educational and methodological complexes.

The level of future lecturers' training has been assessed based on the criteria and corresponding indicators: knowledge (the knowledge about the organization and implementation of network-based learning activities); operations and activities (the ability to manage one's learning activity; skills of using ICT in learning); personality (a steady interest in research as an important component of future training; willingness to enhance skills in independent work); motivation (determination and persistence in mastering electronic educational resources; a steady interest in scientific and pedagogical research). The readiness of future lecturers can be assessed on the following four levels:

An entry level implies that students have fragmentary knowledge about network-based learning activities. They can show some skills in planning a pedagogical experiment, whereas they cannot search for and gather information independently. At the same time, they have only vague knowledge and some skills in the field of ICT and cannot conduct research activities. The information obtained in classes is enough for them, and, therefore, they do not seek to expand their knowledge.

A low level means that students are aware of the basic concepts and have some knowledge about network-based learning activities. They have enough knowledge to reproduce the procedure of verifying the research hypothesis using resources at hand and can search for the necessary information only if the situation so requires and under the guidance of the lecturer. They can process and evaluate the results of scientific and pedagogical research based on the given scenario. Also, they occasionally show a willingness to deepen their knowledge. They are not completely indifferent to the state of affairs and realize the importance of using ICT in research and pedagogical activities. However, they do not pay enough attention to their growth and have doubts about their knowledge, skills and abilities. They are not very persistent, even though they attempt to follow the instructions of the lecturer.

An average level is as follows: students show knowledge and understanding of network-based learning. They can control their learning activity, gather and analyze the obtained information. At the same time, they do not always successfully apply the studied material. They can plan and conduct research activities and are focused on independent search and consolidation of their knowledge. They realize the importance of using ICT and are open to scientific ideas. Besides, they demonstrate sufficient self-confidence to master the means of electronic educational resources, as well as attention and curiosity during the training process.

A high level states that students know and understand the specifics of online learning. They know the stages and features of pedagogical experiments and are ready for non-standard situations. They

demonstrate an understanding of ICT and can find the necessary information and analyze it on their own. Also, they can plan their research activities, analyze and present their conclusions on the problem under study. They pay considerable attention to independent work to deepen their knowledge, perceive scientific ideas and demonstrate their ones. Finally, they show self-confidence and persistence in mastering electronic educational resources, identify the possibilities of improving their level and search for optimal ways of the training.

The obtained results *(see Fig. 1)* show that the majority of students are at an entry level of the training based on the determined criteria.

The results of CG and EG were compared using the nonparametric criterion χ^2. It is statistically confirmed ($\chi^2_{observational} < \chi^2_{critical}$) that the level of training under the determined criteria and indicators in EG and CG coincides at the ascertaining stage of the experiment.

At the formative stage, EG students were trained under the author's methodology of using the network-based educational and methodological complex. The end of the experiment (after the pass/fail exam on the course "The Fundamentals of Scientific Research") involved a check-up test of students' knowledge. Its results indicate certain improvements in the levels of future lecturers' training in CG and EG. However, these indicators are higher in EG than in CG *(see Fig. 2).*

The calculations of the obtained values prove the influence of the independent variable on the results of the experiment. According to ($\chi^2_{observational} < \chi^2_{critical}$), there are some statistically significant differences in the distribution of the levels of future lecturers' readiness under the determined criteria in EG and CG. Thus, the pedagogical experiment confirms the effectiveness of the proposed methodology.

This research shows that the obtained educational results cannot be achieved within the informational and educational environment developed only on traditional methods of teaching and learning. It proves the possibility and pedagogical expediency of using network-based educational and methodological complexes in professional training of future lecturers.

Therefore, the modern educational process can be implemented based on a new type of informational and educational environment. The practice of using the network-based educational and methodological complex "The Fundamentals of Scientific Research" in professional training of future lecturers at M. P. Drahomanov National Pedagogical University indicates the following advantages over the use of only traditional forms and methods of teaching and learning:

– rapid memorization by educational material within the professional course due to illustrations and multimedia of the network-based educational and methodological complex;

– the motivation of students towards pedagogical research using network-based educational and methodological complexes with interactive tools;

– effective acquisition of each topic within the course due to the interconnection between theoretical and practical materials, laboratory work, tests and final tests, electronic versions of educational and methodological sources in such complexes;

– the availability of educational materials;

– a flexible system of students' independent work within the study of the course "The Fundamentals of Scientific Research" with the use of materials from the network-based educational and methodological complex;

– user-friendly and timely check of many students' knowledge with the help of electronic tests.

Conclusions. Thus, it was essential to determine the features of creating network-based educational and methodological complexes, present theoretical principles of selecting and structuring educational material and justify their prospects to realize the objectives of the educational process using such complexes. The author of the paper has developed and implemented the network-based educational and methodological complex "The Fundamentals of Scientific Research". It consists of the organization and information block, the operations and activities
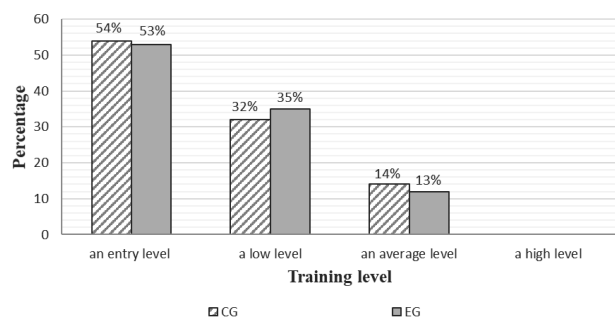

Fig. 1. The levels of future lecturers' training (the ascertaining stage)
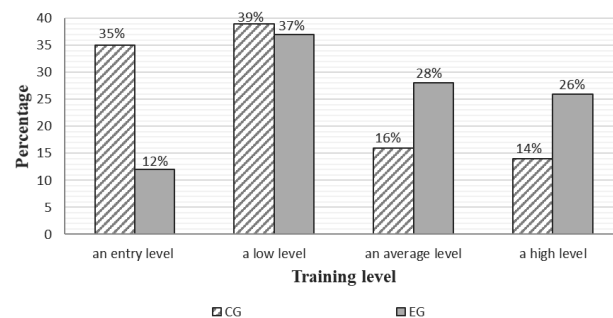

Fig. 2. The levels of future lecturers' training (the formative stage)

block, the motivation and communication block, the evaluation block. It is also based on such criteria as knowledge, operations and activities, personality and motivation, which can be used to assess the levels of future lecturers' training. The results of the experiment concerning the validation of the network-based educational and methodological complex indicate certain statistically significant differences in CG and EG, which confirms the effectiveness of the proposed methodology. The main reason behind it is the lack of mechanisms for the systematic involvement of students in the use of network-based resources. Thus, the network-based educational and methodological complex can become a multifaceted informational and structural element of e-learning, characterized by educational and methodological goals and ensuring a full cycle of future lecturers' professional training, only in compliance with all the requirements. Further research should lie in justifying the concept of training future lecturers to use network-based educational and methodological complexes, as well as preparing students from HEIs and professional (vocational) education schools to use such complexes.

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Використання мережевих навчально-методичних комплексів у фаховій підготовці майбутніх викладачів

Тетяна Криворот[1], Микола Пригодій[2]

1   кандидат педагогічних наук, старший науковий співробітник лабораторії електронних навчальних ресурсів Інституту професійно-технічної освіти НАПН України

2   доктор педагогічних наук, професор, завідувач кафедри промислової інженерії та сервісу Національного педагогічного університету імені М.П. Драгоманова

Реферат.

Актуальність: на сучасному етапі розвитку суспільства мережі впроваджуються до багатьох галузей, і система освіти не є винятком. Використання мережевих технологій є важливим етапом навчання студентів у вищому педагогічному навчальному закладі. Розвиток інтернет-технологій відкриває нові шляхи для впровадження дистанційних технологій та потребує якісного мережевого навчально-методичного забезпечення.

Мета: теоретично обґрунтувати та висвітлити результати експериментальної перевірки методики використання мережевих навчально-методичних комплексів у фаховій підготовці майбутніх викладачів.

Методи: аналіз, систематизація та узагальнення; спостереження, опитування та анкетування; експеримент, методи математичної статистики (критерій ?2).

Результати: розглянуто проблеми освітнього середовища, заснованого на сучасних інформаційно-комунікаційних технологіях з використанням інтернет-технологій. Розкрито дидактичний потенціал мережевих ресурсів для підвищення ефективності освітнього процесу. Доведено, що використання мережевих навчально-методичних комплексів є ефективним для активізації навчально-пізнавальної діяльності студентів. Уточнено поняття, структуру і зміст мережевого навчально-методичного комплексу, обґрунтовано перспективи його використання, а також спрямованість на активізацію, індивідуалізацію та інновацію навчального процесу. Розглянуто методичні питання підвищення якості надання освітніх послуг при використанні дистанційних технологій. Установлено особливості створення мережевих навчально-методичних комплексів, представлено теоретичні основи добору і структуризації навчальних матеріалів та їх коротку характеристику. Розроблено і впроваджено мережевий навчально-методичний комплекс "Основи наукових досліджень" на базі відкритої платформи Moodle, який складається з організаційно-інформаційного, операційно-діяльнісного, мотиваційно-комунікаційного та оцінювального блоків.

Висновки: Розкрито характеристики критеріїв, показників, рівнів оцінювання підготовки майбутніх викладачів та наведено результати експериментального дослідження щодо апробації мережевого навчально-методичного комплексу. Доведено, що відмінності контрольної та експериментальної груп є статистично значущими, що підтверджує ефективність запропонованої методики.

Ключові слова: *мережевий навчально-методичний комплекс, інформаційно-комунікаційні технології, освітнє середовище, програма навчання, майбутні викладачі.*