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5.1. The Essence and Methods of Using Digital Technologies in the Educational Process of Training Specialists in the Specialty A5 Vocational Education

Since education is the transfer of information to the student, digital technologies (DT) are processes related to information processing).

Moreover, any methods or pedagogical technologies describe how to process and transmit information so that it is best absorbed by students. That is, any pedagogical technology is information technology.

When computers began to be so widely used in education that there was a need to talk about digital learning technologies, it became clear that they have long been actually implemented in educational processes, and then the term "new digital education technology" appeared.

Digital technologies include programmed learning, intelligent learning, expert systems, hypertext and multimedia, microworlds, simulated learning, demonstrations. These methods should be used depending on educational goals and educational situations, when in some cases it is necessary to understand the student's needs more deeply, in others – an important analysis of knowledge in the subject area, thirdly, the main role can be played by taking into account the psychological principles of education.

Considering the digital technologies available today, we can highlight their most important characteristics:

– types of digital educational systems (learning machines, training and coaching, programmed learning, intelligent tutoring, manuals and users);

– educational tools used (LOGO, discovery learning, microworlds, hypertext, multimedia);

– tool systems (programming, word processors, databases, presentation tools, authoring systems, group learning tools) [19–23].

As we can see, the main thing in DT is a computer with appropriate hardware and software.

This approach reflects the initial understanding of pedagogical technology as the use of technical means in education.

The influence of the system approach gradually led to the general attitude of pedagogical technology: to solve didactic problems in the direction of managing the learning process with precisely set goals, the achievement of which must be clearly described and defined.

Pedagogical technology is “not just the use of technical means of learning or computers, it is the identification of principles and development of methods for optimizing the educational process by analyzing factors that increase educational

efficiency, by designing and applying techniques and materials, and by evaluating the methods used."

The essence of this approach lies in the idea of complete control over the work of a higher education institution, primarily its main link – the educational process.

Thus, the educational process with its own characteristics comes to the fore, and the computer is a powerful tool that allows solving new, previously unsolved didactic tasks.

The absolute majority of such technologies are based on well-known pedagogical ideas. Moreover, they do not satisfy the basic requirements of the concept of "technology" at all.

Using modern educational tools and instrumental environments, beautifully designed software products are created that do not contribute anything new to the development of the theory of learning. Therefore, we can only talk about the automation of certain aspects of the educational process, about transferring information from paper media to a computer, etc.

We can talk about a new information technology of education only if:

– it satisfies the basic principles of pedagogical technology (pre-design, reproducibility, goal-setting, integrity);

– it solves problems that have not been theoretically and/or practically solved in didactics before;

– the means of preparing and transmitting information to the student is a computer [19].

In practice, digital learning technologies are all technologies that use special technical information means (computers, audio, video films).

When computers began to be widely used in education, the term "new digital technology" arose. In general, any pedagogical technology is information technology, since the basis of the technological process of learning is information and its transformation. The most successful term for learning technologies that use a computer is computer technology.

Digital learning technologies are the process of preparing and transmitting information to a student, the means of implementation of which is a computer.

Digital technology can be implemented in three versions:

I – as a "penetrating" technology – the application of digital learning on individual topics, sections of individual didactic tasks;

II – "basic" – determining the most significant elements used in this technology;

III – "monotechnology" – when all learning, all management of the educational process, including all types of diagnostics, monitoring, are based on the use of a computer.

Educational tools of the DT include various software and hardware tools designed to solve certain pedagogical tasks that have subject content and are oriented towards interaction with students of the specialty A5 Vocational Education (Power Engineering, Electrical Engineering and Electromechanics).

Educational tools of the DT can be classified according to a number of parameters [20]:

1. According to the pedagogical task being solved:

– means that provide basic training (electronic textbooks, educational systems, knowledge control systems);

– means of practical training (task books, workshops, virtual designers, simulation modeling programs, simulators);

– auxiliary means (encyclopedias, dictionaries, reference books, educational computer games, multimedia training sessions);

– complex means (distance learning courses).

2. By functions of organization of educational process:

– information and educational (electronic libraries, electronic books, electronic periodicals, dictionaries, reference books, educational computer programs, information systems);

– interactive (e-mail, remote conferences);

– search (implemented through catalogs, search engines).

3. By type of information: electronic and information resources

– with text information (textbooks, manuals, problem books, tests, dictionaries, reference books, encyclopedias, periodicals, numerical data, program and educational and methodological materials);

– with visual information (collections: photographs, portraits, illustrations, video fragments of processes and phenomena, demonstrations of experiments, video excursions; statistical and dynamic models, interactive models: subject laboratory practicals, subject virtual laboratories; symbolic objects: schemes, diagrams;

– with audio information (sound recordings of performances, musical works, synchronized audio objects);

– with audio and video information (audio-video objects of technical structures, excursions);

– with combined information (textbooks, manuals, primary sources, problem books, encyclopedias, dictionaries, periodicals).

In the practice of the educational process, four main teaching methods can be used:

– explanatory and illustrative;

– reproductive;

– problem-based;

– research.

Given that the first method does not provide for feedback between the student and the educational system, its use in systems using DT is pointless.

The reproductive method of learning with the use of DT involves the assimilation of knowledge communicated to the student by the teacher and (or) a computer, and the organization of the student's activity to reproduce the studied material and its application in similar situations. The use of this with the use of a computer allows you to significantly improve the quality of the organization of the educational process, but it

allows you to radically change the educational process compared to the traditional scheme used (without a computer). In this regard, the most justified is the use of problem-based and research methods.

The problem-based learning method uses the capabilities of DT to organize the educational process as a statement and search for ways to solve a certain problem. The main goal is to maximize the promotion of students' cognitive activity. The educational process involves solving various classes of tasks based on the knowledge obtained, as well as extracting and analyzing a number of additional knowledge necessary to solve the problem. At the same time, an important place is given to the acquisition of skills in collecting, organizing, analyzing and transmitting information.

The research method of teaching using a computer provides independent creative activity of students in the process of conducting scientific and technical research within a certain topic. When using this method, learning is the result of active research, discovery and play, as a result of which, as a rule, it is more pleasant and successful than when using the other methods listed above. The research method of teaching involves studying the methods of objects and situations in the process of influencing them. To achieve success, it is necessary to have an environment that responds to actions. In this regard, an indispensable tool is modeling, that is, a simulated representation of a real object, situation or environment in gradual dynamics.

Computer models have a number of serious advantages over models of other types due to their flexibility and versatility. The use of models on a computer allows you to slow down and speed up the passage of time, compress or stretch space, simulate the performance of actions that are expensive, dangerous or simply impossible in the real world.

DT can be used as a universal technical means of teaching. Such a technical means of teaching allows you to systematically store a huge amount of material and ready-made lesson plans.

The question arises, which program meets the needs of the teacher? After all, this program should be understandable from the first acquaintance, both to teachers and students. Managing the program should be as simple as possible. The teacher should be able to compose the material at his discretion and, when preparing for the lesson, engage in creativity, rather than memorizing the order in which the information will be displayed. The program should allow you to use information in any form of presentation (text, tables, diagrams, slides, etc.). These requirements are met by programs for creating presentations Microsoft PowerPoint, ProShowProducer, Macromedia Flash, etc.

During the lesson, the teacher gradually displays the necessary material on the screen and considers the main issues of this topic. In the case of using a slide-task, he organizes a discussion of the question posed and summarizes it.

If necessary, the teacher can replace the text, picture, diagram or simply hide unnecessary slides. These program capabilities allow you to customize any presentation to a specific lesson in the training of specialists in the relevant specialties.

The systematic use of DT during classes leads to a number of interesting consequences:

1. Increasing the level of use of visualization during classes.
2. Increasing labor productivity.
3. Establishing interdisciplinary connections with computer science.
4. There is an opportunity to organize project activities of students to create curricula under the guidance of computer science and technology teachers.
5. A teacher who creates or uses digital technologies is forced to pay great attention to the presentation of educational material. Which only has a positive effect on the level of students' knowledge [21].

The use of new digital technologies can significantly deepen the content of the material, and the use of non-traditional teaching methods can affect the formation of practical skills and abilities of specialists in the specialty A5 Vocational education (Power engineering, electrical engineering and electromechanics).

5.2. Forms of Using Digital Technologies in the Educational Process of Training Specialists in the Specialty A5 Vocational Education

A feature of a modern higher education institution is its functioning under conditions of rapid growth in the volume of educational resources. A future specialist is no longer always able to receive high-quality educational services in the traditional education system due to its limited information throughput. At the stage of scientific and technological progress, during the transition to an information society, a higher education institution faces an important task - providing students with the conditions to realize their potential in various fields of knowledge.

The processes of integration and informatization of higher education are aimed at resolving a number of objective contradictions that currently exist. This is a contradiction between the growing volume of educational content and the limited amount of educational time; a decrease in the share of knowledge obtained in a higher education institution in relation to the volume of knowledge obtained outside the higher education institution; a partial discrepancy between the content of textbooks and knowledge born of a new educational paradigm.

The process of informatization of higher education allows to supplement the variety of traditional teaching methods with new developing digital pedagogical technologies. With their help, pedagogical situations can be implemented during classes in which the activity of the teacher and students is of a research, exploratory nature.

In modern classes in physics, computer science, technology, disciplines of the heat and power cycle and other disciplines using digital technologies, there is not passive assimilation of information, but its active processing. Such education is of a comprehensive nature and contributes to the formation of a holistic system of knowledge that determines the worldview of the future specialist in heat and power engineering.

The role of a teacher is not limited to the introduction of existing digital technologies into the educational process. Being "at the forefront" of the scientific and

technical process, the teacher himself can become a developer and tester of an arsenal of new teaching tools: from creating illustrations for a specific lesson to producing a software product, from forming a new method of work to creating an author's methodology.

Conducting a lesson on studying new material, like any other type of lesson, involves the teacher choosing a form of the lesson in which the tasks set could have an optimal solution. Most often, the function of explaining the new is implemented in a traditional lesson (combined form), sometimes in a lesson-research, and is in a lecture. The use of DT allowed to make the lecture more attractive to students. Its informative capacity increased, the explanation became more colorful, observation of phenomena and demonstration of experiments were fully supplemented by modeling methods.

However, when conducting lectures, it is necessary to remember the fact that the psyche of some students is not yet sufficiently prepared for the long-term performance of the same type of work. The peculiarity of the lecture is the need to take measures to reduce the mental load on the one hand, and to stimulate the actualization of students' attention for a certain time – on the other. In order to avoid excessive mental fatigue, it is advisable to plan the lecture in such a way that during the lecture the types of educational activities of students are repeatedly modified, passive forms of work are replaced by active ones. One of the ways to stimulate students' attention can be the offer of assessed work (written, test, graphic) with a temporarily distributed lecture task. Another way is to set a number of problem questions at the beginning of the lecture, the answers to which students must provide after the end of the lecture, taking into account the knowledge gained. Despite the fact that knowledge control has ceased to be the purpose of the lesson of learning something new (especially – a lecture), it is the system of mandatory assessment of each student's activity that is able to provide guaranteed effectiveness to the lecture.

Let us consider the following options for using DT in the educational process:

1. Classes with multimedia support – there is a multimedia board in the classroom, which is used by the teacher and students to defend projects.

2. Classes are held with digital support – during the distance learning form of classes.

3. Classes integrated with computer science are held in a computer lab.

4. Independent study using special educational systems [22].

At the same time, one should not forget about sanitary standards regarding the time students spend working at the computer.

In this regard, it may be convenient to have 1-3 computers constantly in the classroom. In this case, the teacher can, when drawing up a lesson plan, foresee a moment when several students can perform individual tasks on the computer, for example, during a frontal survey or consolidating previously studied material.

The constant presence of a computer in the classroom, at which students work, if necessary, will lead to the integration of this rare means of learning into the category of ordinary ones.

Option 1. Classes with multimedia support.

At the stage of preparation for the class, the teacher needs to analyze electronic and information resources, select the necessary material on the topic of the class, structure and format it on electronic or paper media. A catalog of educational resources from various areas of study, posted on the World Wide Web, can provide great help to the teacher in finding the necessary information.

When explaining new material in a class, the teacher can use subject collections (illustrations, photographs, portraits, video fragments of processes and phenomena being studied, demonstrations of experiments, video excursions), dynamic tables and diagrams, interactive models, projecting them onto a multimedia board. In this case, the technology of explanation changes significantly – the teacher comments on the information that appears on the screen, accompanying it with additional explanations and examples if necessary.

The use of DT is possible during the preparation and conduct of non-traditional forms of classes by the teacher. For example, a multimedia lecture.

If the higher education institution is connected to the Internet, it is possible to offer classes in the form of a virtual laboratory or a virtual excursion, which is especially important when studying heat and energy disciplines. The absence of laboratory equipment allows you to spend less time on organizational issues.

Organization of virtual excursions is possible in nature or a research institute, museum.

But students are not simply passive absorbers of information, so the teacher's goal is to form in students the skills of finding and selecting the necessary information. This is achieved through the preparation of projects. The topic of a creative multimedia project should arouse the lively interest of the project participants and may be related to one or more disciplines of the curriculum, as well as to events and problems of the surrounding reality.

During the implementation of the project, students show the highest level of independence - creative. It manifests itself in the course of performing research tasks, when it is necessary to master the methods and techniques of cognition that allow you to see a new problem in a familiar situation, to find new ways to apply the acquired knowledge. Very often, work on a multimedia project develops into scientific work on the development of educational and control programs in various subject areas.

A possible option is when the group is divided into several groups and each group prepares a project from separate sections of a certain topic. After completion, the project is defended: each group presents the results of its research. During the work on the project, they have to process a large amount of information, as a result of which students are well-versed in this issue, and it is difficult to imagine a situation where they would answer questions on this topic poorly. They are so carried away by the topic that they study a lot of material and are happy to show their skills in formatting the results of their work on a computer in the form of a presentation, website, booklet, video. The work is evaluated according to predetermined criteria.

The distinctive features of project work are that during its implementation:

– information is searched for in various sources, its classification and processing are carried out;

– theoretical study of a particular issue must necessarily be accompanied by the acquisition of special practical skills and abilities (scanning illustrations, video editing, integration of objects from various programs, etc.);

– defense requires the development of social communication skills, discussion, the ability to defend one's position with arguments;

– work is mainly carried out in a group, and requires mastering special skills of teamwork and interpersonal communication [23].

Therefore, the creation of a creative multimedia project by students is a powerful tool that allows you to form the necessary knowledge and cognitive techniques, and even develop motivation for educational activities, thereby contributing to the development of motivational and procedural components of cognitive independence. In this didactic process, the teacher has a leading role.

Option 2. Computer-assisted classes.

In this option, there are possible cases when:

– students work simultaneously with the teacher, and at a certain stage switch to working at the computer;

– students take turns working at the computer according to the teacher's instructions.

In this case, a significant part of the lesson takes place as if there was one computer, except that students can receive information from the teacher's screen from each of their computer's thanks to the network capabilities.

When consolidating the material studied, the teacher can offer students to work with the text of an electronic textbook or training manual, reference books, problem sets, a simulator. Using these resources, develop tasks for students taking into account their individual characteristics (level of preparedness, dominant channel of perception, etc.).

To control students' knowledge of the topic studied, the teacher can organize intermediate testing (frontal or differentiated, on a computer or in writing, with automatic checking on a computer or with further checking), solve puzzles, crosswords, game situations using the knowledge gained.

Independent excursions on the Internet, viewing multimedia lectures, students performing laboratory work (for example, reproducing demonstration experiments that the teacher showed in class, or conducting experiments that are impossible to do in real life for some reason), etc. are also possible.

Option 3. Integrating the lesson with computer science.

The tasks of such a lesson: to practice educational material using computer technology to create crosswords, graphs, games, tables and diagrams (Paint graphics editor and other applications); to learn to perform project work (Microsoft PowerPoint); to teach how to write and correctly design letters (Microsoft Word word processor); to teach how to beautifully and competently design texts (Microsoft Word word

processor); in general, to expand students' knowledge of the topics studied through the use of computer technology.

The course of such lessons can be divided into several stages:

At the first stage, it is proposed to conduct a short warm-up, during which students repeat the material of the discipline.

At the second stage, the computer science teacher repeats with the students the basic rules of working with the software product that they will use in the lesson.

At the next stage, students work individually at the computer to complete the task.

At the fourth stage, the work is defended, shown and evaluated by teachers.

At the fifth stage, the degree of achievement of the goals and tasks set in the lesson is determined, the results are summed up, and marks are given.

Integrated computer science – geometry – technology lessons can be held. ("Making polygonal models of figures from wire")

Geometric material becomes accessible and understandable to students when working with special programs for constructing geometric drawings.

Mathematics and computer science lessons are successful: it takes much less time to construct drawings in Excel than in a notebook, due to this, a large number of examples are considered.

Option 4. Independent work of students with electronic information resources.

This option assumes that traditional classes on the subject are replaced by independent work of students with electronic information resources (50% of educational time) and consultations.

The necessary conditions for the effective use of this option are: equipping the computer room with a local computer network, the availability of special educational systems. In the distance option, access to the Internet is required.

Here, the teacher plays the role of a consultant, so we will not dwell on this option in detail, since we consider the DT only as an assistant to the teacher, and not his deputy.

Forms of computer use.

There are three main forms in which a computer can be used when performing its educational functions:

– a machine as a simulator;

– a machine as a tutor, which performs certain functions for a teacher, and the machine can perform them better than a person;

c) a machine as a device that simulates certain subject situations (simulation modeling).

Of course, the use of computers when teaching heat and power disciplines is justified only if: if the computer is a means of facilitating work – otherwise why?

When determining the goals, objectives and possibilities of using digital technologies when studying heat and power disciplines, the teacher can, first of all, keep in mind the following fundamental positions:

– preserving the mental and physical health of students;

– developing basic skills and abilities in students;

– helping students learn educational material based on specially and competently created computer applications for this purpose.

The listed tasks, if the teacher is going to follow them, completely exclude such a structure of the learning process as one hundred percent sitting at the computer.

In conclusion, it can be noted that various forms of educational activity are needed: frontal work on updating knowledge, group or pair work of students on mastering specific educational skills, didactic games, the work of the consulting service, and interesting oral and written tasks. All of them should be arranged in such a way that digital learning technologies become not an end in themselves, but only a logical and very effective addition to the educational process.

As a result of the analysis of pedagogical and methodological literature, we found out that digital learning technologies are the process of preparing and transmitting information to the student, the means of which is a computer. Digital learning technologies include various software and hardware tools designed to solve certain pedagogical tasks that have subject content and are focused on interaction with students.

In practice, in the process of training specialists in the specialty A5 Vocational Education (Energy, Electrical Engineering and Electromechanics), four main training methods can be used:

– explanatory-illustrative;

– reproductive;

– problematic;

– research.

Given that the first method does not provide for feedback between the student and the learning system, its use in systems using digital technology is pointless.

We have identified four main forms of using digital technologies in the process of training specialists in the specialty A5 Vocational Education (Energy, Electrical Engineering and Electromechanics):

1. Classes with multimedia support – there is a multimedia board in the classroom, which is used by the teacher and students to defend projects.

2. Classes are held with digital support – during the distance learning form of classes.

3. Classes integrated with computer science are held in a computer lab.

4. Independent study using special educational systems.

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ANNOTATION

CHAPTER 1. MODERN BASICS OF ECONOMICS, MANAGEMENT AND TOURISM

1.1. Ulyana Balyk, Yurii Stevchak IMPLEMENTATION OF DIGITAL MARKETING TECHNOLOGIES IN CONFECTIONERY INDUSTRY ENTERPRISES OF UKRAINE: ANALYSIS OF TRENDS 2020–2025

The article explores the trends in the digitalization of marketing processes at confectionery industry enterprises in Ukraine for the period 2020–2025, it examines the impact of digital technologies on customer interaction, and consumer behavior analytics. The study analyzes the application of modern digital marketing tools using the examples of domestic manufacturers. Recommendations are provided for further digital transformation of the industry.

Keywords: digitalization, marketing, confectionery industry, digital technologies, consumer analytics.

1.2. Olha Hirna KAIZEN AS A CONCEPT OF CONTINUOUS IMPROVEMENT: THEORY AND PRACTICE OF APPLICATION

The theoretical foundations of continuous improvement of production processes, development of supporting business processes, and their management are presented. The relationship between Kaizen and the theory of total quality management (TQM) is revealed. Practical aspects of implementing Lean Production (LP) and Just-in-time (JIT) based on Kaizen are presented. The importance of developing the TFL model is emphasized. New progressive directions for the development of this concept are outlined. Practical aspects of the concept in the activities of well-known world companies are presented.

Keywords: Kaizen, Total Quality Management (TQM), Lean Production (LP), Just-in-time (JIT), Gemba Kaizen, Blitz Kaizen.

1.3. Bohdan Kyshakevych USING ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING TECHNOLOGIES TO IMPROVE THE EFFICIENCY OF CUSTOMS RISK MANAGEMENT

The article explores the role of artificial intelligence and machine learning in optimizing customs risk management processes. Modern AI and ML tools used to predict and identify customs risks are analyzed. The world experience in implementing intelligent technologies in the activities of customs authorities is revealed. Special attention is paid to the legal aspects of using AI in the customs sector. The advantages of using intelligent systems to increase the efficiency of customs control are substantiated.

Keywords: Artificial intelligence, machine learning, customs risk management, risk management, customs digitalization, ethical aspects of artificial intelligence.

CHAPTER 2. INNOVATIONS IN MODERN MEDICINE AND BIOLOGY

2.1. Aelita Krychkovska, Iryna Hubytska, Nataliia Monka, Olena Khomenko INNOVATIONS IN MEDICINE AND PHARMACY: A STUDY OF THE EXPANSION OF THE PHARMACEUTICAL MARKET OF UKRAINE CONSEQUENCES OF REGULATORY SUPPORT OF CANNABINOIDS CIRCULATION

CHAPTER 5. Serhii Onyshchenko THEORETICAL AND METHODOLOGICAL FOUNDATIONS OF THE USE DIGITAL TECHNOLOGIES IN THE PROCESS OF TRAINING SPECIALISTS IN THE SPECIALTY A5 VOCATIONAL EDUCATION (ENERGY, ELECTRICAL ENGINEERING AND ELECTROMECHANICS)

The development of new digital technologies and their implementation in the educational process in terms of distance education have left a certain imprint on the development of a modern specialist. It is important to organize the learning process so that students actively, with interest and enthusiasm, master professional qualities, see the fruits of their labor and be able to evaluate them. A combination of traditional teaching methods and modern digital technologies can help the teacher in solving this difficult task.

Digital technologies develop the ideas of programmed learning, open up new, not yet explored technological options for learning, associated with the unique capabilities of modern digital technologies.

In the theory and practice of using digital technologies in the educational process of training specialists in the specialty A5 Professional Education (Power Engineering, Electrical Engineering and Electromechanics), contradictions are increasingly evident between: the need of society in information training of specialists and the lack of a holistic theoretical and practical justification for the use of digital technologies in the educational process.

This contradiction indicates the presence of a problem, which consists in the lack of justification for the process of using digital technologies in the educational process of training specialists in the specialty A5 Vocational Education.

Keywords: digital technologies, software, information educational environment, information training, teaching methods.

ABOUT THE AUTHORS

CHAPTER 1. MODERN BASICS OF ECONOMICS, MANAGEMENT AND TOURISM

1.1. Ulyana Balyk – PhD in Economics, Associate Professor, Associate Professor of the Department of Marketing and Logistics, Lviv Polytechnic National University, Ukraine

Yurii Stevchak – PhD student at the Department of Marketing and Logistics, Lviv Polytechnic National University, Ukraine

1.2. Olha Hirna – PhD in Economics, Associate Professor, Associate Professor of the Department of Management of Organizations, National University "Lviv Politechnic", Ukraine

1.3. Bohdan Kyshakevych – Doctor of Economic Sciences, Professor, Professor of the Department of Foreign Economic and Customs Activities, Lviv Polytechnic National University, Ukraine

CHAPTER 2. INNOVATIONS IN MODERN MEDICINE AND BIOLOGY

2.1. Aelita Krychkovska – Candidate of Pharmaceutical Sciences, Associate Professor, Associate Professor of the Department of Technology of Biologically Active Compounds, Pharmacy and Biotechnology, Lviv Polytechnic National University, Lviv, Ukraine

Iryna Hubytska – Candidate of Chemical Sciences, Associate Professor, Associate Professor of the Department of Technology of Biologically Active Compounds, Pharmacy and Biotechnology, Lviv Polytechnic National University, Lviv, Ukraine

Nataliia Monka – Candidate of Chemical Sciences, Associate Professor, Associate Professor of the Department of Technology of Biologically Active Compounds, Pharmacy and Biotechnology, Lviv Polytechnic National University, Lviv, Ukraine

Olena Khomenko – Candidate of Chemical Sciences, Assistant, Higher Private Educational Institution "Lviv Medical University", Lviv, Ukraine

CHAPTER 3. INNOVATIVE AND MODERN FOUNDATIONS OF PEDAGOGY AND PSYCHOLOGY

3.1. Nadiia Borysenko – PhD of Pedagogical Sciences, Associate Professor, Associate Professor of the Department of Technological and Professional Education, Oleksandr Dovzhenko Hlukhiv National Pedagogical University, Ukraine

3.2. Vladyslava Liubarets – Doctor of Pedagogical Sciences, Professor, Professor of the Academy of Labour, Social Relations and Tourism, Ukraine

Nataliia Rodinova – Candidate of Historical Sciences, Associate Professor, Associate Professor of the National Academy of Managerial Personnel of Culture and Arts, Ukraine

Svitlana Litovka-Demenina – Candidate of Pedagogical Sciences, Lecturer, Lecturer of the Kyiv Vocational College of Tourism and Hotel Management, Ukraine

CHAPTER 4. THE LATEST BASICS OF AGRICULTURAL DEVELOPMENT

4.1. Olha Fedoryshyn – Ph.D of Technology Sciences, Senior Lecturer of the Department of Technology of Bioactive Compounds, Pharmacy and Biotechnology, Lviv Polytechnic National University, Ukraine

CHAPTER 5. THEORETICAL AND METHODOLOGICAL FOUNDATIONS OF THE USE DIGITAL TECHNOLOGIES IN THE PROCESS OF TRAINING SPECIALISTS IN THE SPECIALTY A5 VOCATIONAL EDUCATION (ENERGY, ELECTRICAL ENGINEERING AND ELECTROMECHANICS)

5.1., 5.2. Serhii Onyshchenko – PhD, Associate Professor, Associate Professor of the Department of Professional Education and Technologies, Berdyansk State Pedagogical University, Ukraine