MINISTRY OF HEALTH PROTECTION OF UKRAINE

ODESSA NATIONAL MEDICAL UNIVERSITY

Faculty of Medicine

Department of General and Clinical Epidemiology and Biosafety with a course in microbiology and virology

I APPROVE

Vice-rector for scientific and pedagogical work

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METHODICAL DEVELOPMENT OF PRACTICAL LESSONS

Faculty of Medicine, course 3

Educational discipline "BASES OF SCIENTIFIC RESEARCH"

Approved:

Meeting of the department of general and clinical epidemiology and biosafety with the course of microbiology and virology of the Odessa National Medical University

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Practical lesson No. 1

SUBJECT: "Science and its role in society" - 2 hours

Goal:acquaintance with the concept of science and classification of sciences. Definition of science, its goals and tasks. Method and methodology.

Basic concepts:

Term	Definition
Science	is a process of creative activity to obtain new knowledge, and the result of this activity is a complete system of knowledge formed on the basis of certain principles.
Determinism	is the doctrine of the universal objective regular relationship and causal conditioning of the phenomena of the socio-natural environment.

Actuality of theme

The main form of human knowledge is science. Nowadays, science is becoming an increasingly significant and essential component of the reality that surrounds us and in which we somehow have to navigate, live and act. Philosophical vision of the world presupposes certain ideas about what science is, how it is organized and how it develops, what it can do and what it allows us to hope for, and what is not available to it. In the philosophers of the past, we can find many valuable predictions and hints, useful for orientation in such a world, where the role of science is so important. However, they were unaware of the real, practical experience of the massive and even dramatic impact of scientific and technical achievements on the everyday existence of a person, which has to be understood today.

Science is a process of creative activity to obtain new knowledge, and the result of this activity is in the form of a complete system of knowledge formulated on the basis of certain principles.

Science is the highest level of human mental development, the highest and most specific achievement of human culture. It can be formed only under certain conditions. The concept of "science" in this specific sense exists only since the time of the great ancient Greek thinkers Plato and Aristotle. But already in the Middle Ages it was relegated to the periphery of human existence. During the Renaissance, science was once again restored to its rights. Since then, her position has been steadfast.

Science is a sphere of human activity, the function of which is the production and systematization of objective knowledge about reality; one of the forms of social consciousness.

In the process of historical development, science has turned into a productive force and an important social institution. It affects state, social and public life. The concept of "science" covers both activity aimed at obtaining new knowledge, and the result of this activity - the sum of knowledge acquired for a certain time, the totality of which creates a scientific picture of the world.

Plan

I. Organizational moment (greetings, checking those present, announcing the topic, the purpose of the lesson, motivating students to study the topic).

II. Control of basic knowledge: Theoretical questions for the lesson:

III. Formation of professional skills and abilities. Practical works (tasks) performed in class:

- Description of the activity of science;
- Registration of results;
- Principles of science.

Topic content:

Science as an activityis a procedure of generalizing reality, and science, as a system of knowledge, is the sum of judgments that are generalized. The definition of any phenomenon boils down to indicating the unchanging thing that is preserved in it throughout its existence, regardless of all its metamorphoses. Therefore, when defining science, it is necessary to pay attention first of all to what is stable in it, that is, not to specific judgments (knowledge) characteristic of its historical state, but to "eternal" features of the cognitive procedure. Therefore, science is a generalization of reality, a sum of knowledge-judgments corresponding to a specific scale of generalization.

Science is one of the productive forces of society, its purpose, as the German philosopher Gottfried-Wilhelm Leibniz claimed, is the well-being of mankind, the achievement of everything that is useful for people.

Science always develops in specific historical conditions, which are determined primarily by the level of development of society. Its inherent means of production and technology pose specific tasks to science, create opportunities for the realization of its achievements. History knows many examples when social relations inhibited the development of science, hindered the use of its discoveries. In turn, the achievements of science and technical progress contribute to the development of society.

Science involves the process of obtaining new knowledge and the result of this process (a system of objective knowledge that adequately reflects reality). It is endowed with essential features that fundamentally distinguish it from other possibilities of knowing the world.

In contrast to mythology and religion, science is objective, has a research apparatus and certain schemes of proof, capable of distinguishing true knowledge from false or subjective. Science seeks to know the inner essence of phenomena and to build a system of knowledge, as opposed to objective empirical knowledge obtained on the basis of practical experience, which describes only the external aspects of the phenomenon.

The system of scientific knowledge consists of discovered facts, their conceptual, qualitative and quantitative description, as well as empirical regularities established through their analysis. However, for a holistic scientific understanding of reality, it is necessary to define the general or common law or group of laws that applies to the entire creation of the world or its individual parts.

A law is a necessary, essential, stable relationship that repeats itself between individual phenomena. Among the many laws formed by science, common (fundamental), general and partial laws are distinguished. Common laws are found in

all spheres of life (laws and principles of self-organization and evolution). General laws relate to some extent to related scientific fields. For example, the laws of conservation, orientation of processes, and periodicity are found in all natural sciences and partly in the humanities. Partial laws operate in a separate field, for example, the law of the vector of historical development - in history, the law of genetics - in biology, the laws of Newton and Einstein - in physics.

Knowledge, a conceptual and qualitative description of facts based on empirical patterns is a prerequisite for the formulation of initial, fundamental ideas, a theory or a group of theories. Thanks to them, an adequate reflection in thinking of the state of nature and human existence, a scientific vision of the picture of the world as a general objective image of reality (a set of objective knowledge united by general conceptual ideas, principles and laws functioning in various fields of knowledge) is made possible.

The disclosure of laws is connected with the search and awareness of cause-and-effect relationships between individual phenomena. In the process of establishment of science, philosophical understanding of its results, a teaching was formed, which received the name "determinism".

Determinism is the doctrine of the universal objective regular relationship and causal conditioning of the phenomena of the socio-natural environment.
Dynamic and statistical levels are separated in the system of causal relationships, laws and regularities.

Dynamic laws reflect an objective regularity as an unambiguous relationship between the average values of the parameters characterizing the state of the system. For example, the laws of classical mechanics establish a relationship between the parameters of the movement of individual macrobodies. Knowing them, you can always reliably and unambiguously predict what the parameters of the state (movement) of the body will be at any moment in time. In reality, there are always random deviations from the average value. Randomness is a fundamental property that underlies all phenomena and guides their development. But, in particular, according to the classical description of the movement of individual macrobodies, it mostly does not play a significant role, is perceived as an error and is not taken into account.

Statistical laws describe the behavior of complex systems formed from many particles, for example, the law of the distribution of gas molecules by speed. In this case, the behavior of the system can only be predicted with a certain probability. In the microcosm, probabilistic representations are used to describe the state of even a single elementary particle, and the laws of the microcosm are considered fundamentally statistical. When describing the state of such systems, fluctuations play a decisive role. With the simultaneous presence of various fluctuations, there will always be many options for the development of the system. Any random external influence, internal reasons under a certain coincidence of circumstances can significantly affect its development. Under such conditions, cause-and-effect relationships are non-linear and multi-valued, determinism is more noticeable.

Modern science has developed the idea that dynamic laws are not an absolutely accurate reflection of reality. Since randomness is temporary, statistical laws are the

deepest and most general form of describing the processes of the socio-natural environment; they reflect natural relationships more objectively than dynamic laws. The determinism of events manifests itself when moving from a micro description of the behavior of systems to a macro description, when it is necessary to average the measured values.

The most important feature of science is the research method - a set of techniques and operations, methods of substantiating the knowledge system, controlling the objectivity of the obtained results, building models of reality. It is not arbitrary, but determined by the objective possibilities of science, the features of the object of knowledge. The term "methodology" is used to denote the set of methods used in a specific science, which also means the teaching of scientific methods of understanding the world.

Science is a socio-cultural activity, a kind of social phenomenon. The main task of science is to identify the objective laws of reality, and its main goal is true knowledge.

The criteria of scientificity that distinguish science from other forms of knowledge are: objectivity, systematicity, practical focus, orientation to predictions, strict evidentiality, reasonableness and reliability of results.

In contrast to vital, that is, pre-scientific knowledge, the level of which is mostly limited to the description of relevant facts, scientific knowledge reaches a higher level - the level of explanation, comprehension of facts in the conceptual system of the relevant science, and is included in the composition of the theory.

The essence of scientific knowledge lies in the understanding of reality in its past, present and future, in the probable generalization of facts, in the fact that it finds the necessary, regular, and the general in the random, and on this basis prediction (forecasting) is made.

The methodology of science distinguishes such functions of science as description, explanation, prediction, understanding.

Science is a complex study and theoretical generalization of the experience of the functioning of science as a whole system with the aim of increasing the efficiency of the processes of scientific activity with the help of means of social influence.

Concepts developed by modern logic and methodology of science, about theoretical knowledge are aimed at research and creation of separate theoretical formations - theories. Specific sciences feel the urgent need for methodological substantiation of the necessary single integrated system of knowledge. It is recognized that it is necessary to make corrections in modern methodological settings that will allow solving the issue of the unified organization of scientific and theoretical knowledge in general and in specific fields of knowledge.

An important yet unsolved problem is the need to systematically identify further logical possibilities for the development of the sciences, possibilities not only for their internal self-determination, but also for the formation of a single coherent logical system of scientific knowledge.

The task of achieving scientific coherence of blocks of knowledge, in particular theories that reflect separate fragments of reality, but in the current century it is recognized as a necessary condition for the further progress of scientific and

theoretical knowledge. Modern methodological self-awareness of science has proven a lot that one of the most important trends is the direction towards the unity of scientific knowledge.
With the help of a systemic approach, a conceptual basis for imagining life as a hierarchical value is formed.

Modern scientific methodology is based not on perspective, on the impossibility of obtaining knowledge about a subject in the old way, when its various aspects are studied in isolation from each other, and the theoretical synthesis to create a single idea about the object (subject) based on separately obtained knowledge about it is postponed for the future.

The arrangement of the conceptual apparatus turns out to be a rather complex problem that requires studying, revising, and improving the theories of specific sciences and which cannot be limited by random mathematical formulations of specific theories.

The problem of understanding a specific field of knowledge as a single system, and not as a simple collection of theories, can be considered only under the condition of consciously managing that concept of theoretical knowledge, in which the composition of specific scientific knowledge is connected with a dialectically dismembered subject of science.

Therefore, the problem of synthesis of scientific knowledge into a theoretical system depends on the level of knowledge of the subject of science as a dialectically dismembered integrity, on the readiness of science to methodically use this knowledge to reorganize its structure.

Such readiness is gradually, mostly spontaneously, already formed on the basis of the logical and epistemological possibilities that science possesses at a specific historical moment of its development for a holistic coverage, a vision of its subject.

The historical development of science was uneven. Stages of rapid and even rapid progress were followed by periods of stagnation and sometimes decline. In ancient times, physical and mathematical sciences gained special development in the territories of Ancient Greece and Ancient Rome, and in the Middle Ages, their center moved to the East, primarily to India and China. In the New Age, Europe once again took the initiative in the development of physical and mathematical sciences.

Throughout the history of science, two trends have interacted that complemented each other - to deepen specialization and strengthen the desire for integration. Simultaneously with the differentiation of science, its division into often very specialized disciplines, its gradual integration is also taking place, which is based on the combination of scientific methods, ideas and concepts, as well as the need to consider seemingly disparate phenomena from a single point of view. The most important consequences of the integration of science include the simplification of information processing and search, freeing it from excess methods, models and concepts. The main way of integration is the formation of "interdisciplinary sciences", which connect traditional specialties and thus enable the emergence of a universal science, designed to create a kind of framework that would unite separate sciences into a single whole. The more integrated science is, the more it meets the

criterion of simplicity and economy.

With the dismemberment of science into separate disciplines, there are fewer connections between them, and the exchange of information becomes more difficult. Analyzing similar objects, resorting to the same methods, the fields are often interpreted in different languages, which complicates interdisciplinary research.

Integrative trends in science are actively manifested in the post-industrial (information) era, which is largely connected with the development of computer and communication technology and the emergence of the global information network - the Internet. More noticeable is the desire to formulate new tasks of a higher level of generalization, even universal ones, which often unite distant fields of knowledge. The process of creating general concepts, concepts, and scientific language continues. A characteristic feature of modern science is the increasing interest in the search for the fundamental structural generalization of heterogeneous systems and general mechanisms of various phenomena, which contribute to the integration of science, its logical coherence and unity, which provides a deeper understanding of the unity of the world. Modern scientific views are characterized by the idea of the existence of general models of various phenomena, isomorphism (sameness) of structures at different levels of organization. The awareness that the presence of general principles and models in different fields of knowledge makes it possible to transfer them from one field to another is confirmed, which contributes to the general progress of science. At the same time, it is considered that the integration of science is not a reduction (return) of sciences to physics (reductionism), but an isomorphism of systems with different natures of their elements, structures of different levels of organization. The presence of isomorphisms of the most diverse systems plays a certain heuristic role, since they not only characterize the conceptual framework of modern science, but also facilitate the choice of directions of specific research, make it possible to avoid duplication of theoretical research, etc.

Radical qualitative shifts in the development of science are defined as scientific revolutions. This is how the emergence in the 17th century was assessed. natural sciences. It proved that science gained historical power, and scientific knowledge surpassed the importance of technology. Since then, scientific ideas about the surrounding world began to compete with everyday ideas. Being a natural stage in the development of science, the scientific revolution of the 17th century. fundamentally changed the idea of the structure of the universe and the place of man in it. It caused a break in human thinking, encouraged scientific creativity, directed the gaze and thought of scientists into previously inaccessible areas.

The most important features of the scientific revolution include:

1. Bright creative character. Previously acquired knowledge was not destroyed, but was interpreted in the context of a new understanding of it.
2. Change according to new ideas, new interpretation of previously acquired knowledge. During the period of the scientific revolution, something new is created on the basis of what already exists. Unexpectedly, it turns out that the elements of the new have been ripening in the available information for a long time. Therefore, the scientific revolution is not an instant revolution, since the new does not immediately receive recognition in science.

3. The appearance of a large number of talented individuals within 1-3 generations. They raise a whole layer of knowledge to an unprecedented height and have been unmatched for a long time.
4. Rapid development of physical and mathematical sciences.

As a special social institution, science begins in the 17th century, with the emergence of the first scientific societies and academies, its history spans three scientific revolutions.

The first scientific revolution (XVII-XVIII centuries). In this period, the formation of classical natural science took place. Its main criteria and characteristics are the objectivity of knowledge, the reliability of its origin, the removal from it of elements that do not relate to the cognitive subject and the procedures of his cognitive activity. The main requirement for science was the achievement of pure objectivity of knowledge. Science quickly gained prestige and authority, claiming together with philosophy to be the only adequate embodiment of reason. The growing authority of science led to the emergence of the first form of scientism (knowledge, science), whose supporters absolutized the role and importance of science. The so-called scientific (ideological) utopianism was formed in his bosom - a theory according to which social relations can be fully known and transparent, and politics is based on exclusively scientific laws that coincide with the laws of nature. The French philosopher and writer Denis Diderot, who considered society and man through the prism of natural science and natural laws, was inclined to such views. Accordingly, he identified man with all other natural objects, machines, the role of the conscious principle in it was narrowed, or even ignored. Since the main science of the period was mechanics, the general scientific picture of the world of classical natural science had a pronounced mechanistic character.

At the end of the 18th century the first scientific revolutionturned into an industrial one, the consequence of which was the development of a capitalist industrial society and industrial civilization. Since then, the development of science has largely been determined by the needs of the economy and production.

In the 19th century science underwent significant changes, its differentiation caused the formation of many independent scientific disciplines with corresponding areas of competence. In this process, mechanics lost its monopoly on the interpretation of the general scientific picture of the world, and the positions of biology, chemistry, and geology were strengthened. The style of scientific thinking changed significantly, in which the idea of development gained importance. Since then, the object of knowledge, including nature, has been considered not as a complete and stable thing, but as a process. In general, science continued to develop within the limits of the classical form, further claiming the absoluteness of an exhaustive vision of the picture of the world. Her public authority and prestige grew steadily.

The second scientific revolution (the end of the XIX - the beginning of the XX century.). It caused the emergence of a new, non-classical science, which includes the discovery of the electron, radio, the transformation of chemical elements, the creation of the theory of relativity and the quantum theory, penetration into the microcosm and knowledge of high speeds. Radical changes took place in all areas of

scientific knowledge. New scientific directions, in particular cybernetics and systems theory, have declared themselves.

Non-classical science no longer made claims to complete or absolute objectivity of knowledge, to the absence of a subjective aspect in it. The role of the subjective factor has dramatically increased in it. It increasingly took into account the influence of methods, ways and means of knowledge. It was indisputable for her that knowledge is determined not only by the nature of the cognitive object, but also by many other factors, her knowledge was steadily deprived of empiricism, lost its research origin, becoming purely theoretical. The theories and models built by the cognitive subject with the help of mathematical, statistical, combinatorial and other approaches began to acquire special importance in cognition.

In the field of knowledge and in the coordinates of each of the sciences, the process of differentiation is intensifying, the result of which was an increase in the number of scientific disciplines and schools. Thanks to this, the tendency towards pluralism was outlined. The existence of various schools and trends, different views on the same problem within science became acceptable. At the highest levels of knowledge, the pluralism of general pictures of the world, which claimed to be true, also revealed itself. The principle of relativism - the relativity of human knowledge - has gained relevance, according to which each theory is recognized as true only in a specific system of data or coordinates. In scientific circulation, the concept of "truth" is increasingly inferior to the concept of "validity", which means reasonableness, acceptability. A similar fate befell such concepts of classical science as "causality", "determinism", which gave way to the concepts of "possibility" and "indeterminism".

The third scientific revolution (the middle of the 20th century - the present). Since it was a continuation of the second scientific revolution, it is also called scientific-technical or scientific-technological. Its main result was the emergence of post-nonclassical science. Just as the first scientific revolution turned into an industrial revolution, which gave rise to an industrial civilization, the third scientific revolution turned into a technological revolution, which forms a post-industrial civilization, corresponding to a post-industrial, informational, post-modern society. The basis of this society is the latest high and subtle technologies, which are based on new sources and types of energy, new materials and means of managing technological processes. An exceptional role is played by computers, means of mass communication and informatics, the development and spread of which have acquired gigantic proportions.

During the third scientific revolution, the quality of direct and basic productive power, the main factor of production and public life, appears in science. Her connection with production became direct and inseparable, in interaction with which she assumed a leading role, continuing to discover, reviving the latest and highest technologies, new sources of energy, materials.

Science has undergone profound changes. First of all, the elements of the process of cognition have become more complicated - the cognizing subject, means and object of cognition, their relationship has changed. The subject of the cognitive process is rarely one scientist who independently investigates some object. Most often, it is formed by a team, a group, the number of which remains uncertain. The

subject of cognition ceases to be outside its object, to be opposed to it, and is included in the process of cognition, becoming one of the elements of the coordinate system of this process. To study the object of knowledge, direct contact and interaction with it is often not required. His research is often carried out over long distances. Often, the object of knowledge lacks any outlines, being a part or fragment of a conventionally isolated phenomenon. The role of the means and methods of cognition is constantly growing, becoming crucial.

3. Classification of sciences.

From the beginning of science, the development of knowledge was based on its classification according to one or another feature, which played a decisive role in the organization, construction, specialization of knowledge and cognitive activity. Therefore, the classification of sciences as a logical-methodological, axiological and socio-cultural problem is reflected in many philosophical and scientific studies, which, considering the structure of science from one point of view and not claiming completeness, complement each other, presenting a fairly broad idea of the principles of formation and development and functioning of science. The multifaceted forms of scientific research necessitate their classification, taking into account the subject, character, and interrelationship of various types of research. At the same time, they achieve not only the theoretical, but also the practical goal of the development of science.

Within different research positions, there are different approaches to the problem of differentiation of scientific knowledge. The most famous and most recognized classifications of sciences and scientific research are their demarcation by criteria:

- object and subject of research (mechanics, physics, chemistry, biology, physiology, geography, etc., as well as the sciences formed as a result of their synthesis - biophysics, biochemistry, physical chemistry, etc.);
- areas of research (natural, social and technical);
- ways and methods of obtaining new knowledge (theoretical and empirical sciences);
- connections with the subject activity (theoretical and practical sciences).

The problem of the classification of sciences has such a long history as science itself, so any scientific analysis claiming integrity cannot avoid considering the history of the issue, since in each historical era scientific knowledge performed peculiar functions. This was due to the level of development of science, the ability of society to use existing knowledge. Already in the days of antiquity, not only new knowledge was produced, but also attempts were made to classify the existing ones. One of the first such attempts was made by Democritus, who divided the scientific system into three parts: introductory ("canonics" as the doctrine of truth and its criteria); physics (the science of various manifestations of existence); ethics (derived from physics). In his classification, all sections were organically combined: "canonics" belonged to physics as its original section, it was not logical in nature, but justified the correctness of the path chosen by the system, defended the basic provisions of the scientific system from students hostile to it. Ethics was considered

an adjunct to physics. In the context of the problem of differentiation of scientific knowledge, Aristotle raised the issue of the need to organize knowledge itself and develop the art of cognitive activity. Classifying sciences according to the theoretical level and historical conditions of their emergence, he separated, on the one hand, philosophy, mathematics, physics, and on the other - arts and sciences that serve neither for pleasure nor for necessary needs. This shows that he considered scientific knowledge as a self-value regardless of its possible practical application.

Such a supporter of organizing scientific knowledge in the Western European tradition was the modern science reformer, the English philosopher and political figure Francis Bacon. In his writings, he divided knowledge into that which guesses nature and that which interprets it, and also sought to classify all sciences based on the internal logic of their development.

The classification of sciences proposed by the German thinker Friedrich Engels corresponded to the level of development of knowledge in the second half of the 19th century. Considering the principles of material unity of the world and its inexhaustible qualitative diversity, he separated the sciences according to the forms of movement of matter described by them. On this basis, Engels argued that the classification of sciences, each of which analyzes a separate form of movement or a number of interconnected and interrelated forms of movement, is at the same time a classification, an arrangement, according to the sequence of these forms intrinsic to them movement, and this is its meaning. He laid the principle of objectivity as the basis of the differentiation of sciences, according to which differences between sciences are due to differences in the objects of their research. They are existing forms of movement of matter (mechanical, physical, chemical, biological, social).

With the emergence in Western Europe at the end of the XIX century. of non-classical philosophy, the criteria for the classification of sciences also changed. Thus, the German philosopher Heinrich Rickert, seeking to show the confusion and complexity of the problem of classification of sciences and all the helplessness in this matter of conventional schemes, believed that empirical sciences fall into two main groups: natural sciences (sciences that study physicists, chemists, anatomists, physiologists, biologists , geologists) and cultural sciences (which are studied by theologians, lawyers, historians and philologists), i.e. social and humanitarian sciences. Realizing that both groups of sciences are connected by many ties, and denying their absolute opposition, he considered the main differences between them. The philosopher believed that this would help to find the starting points for differentiating the sciences of culture as younger in terms of time of origin, between which, unlike the natural sciences, close connections have not yet been established.

The German philosopher Edmund Husserl made an important contribution to the classification of sciences. Creating phenomenological philosophy, he distinguished between pure phenomenology, as the science of phenomena (phenomena), and other sciences that also investigate phenomena: psychology - the science of mental, natural science - the science of physical phenomena (phenomena); history - the science of historical phenomena, culture - the science of cultural phenomena. These two types of science deal with phenomena of a different order: concrete sciences are sciences of facts, pure or transcendental phenomenology is

grounded not as a science of facts, but as a science of essences, which aims to ascertain knowledge of essence.

Husserl considered pure logic, pure mathematics, pure science of time, space, movement, etc., devoid of experimental justification, to be pure sciences of essences. He counted the sciences of facts as experimental, meaning the sciences of nature and the sciences of the spirit, since experimental knowledge is for them an act of proof.

E. Husserl belongs to the classification - according to the nature of the concepts formed by certain sciences. According to this feature, he divided all sciences into descriptive sciences, which are based on description, using descriptive (descriptive) concepts, and exact sciences, which are clarified with the help of an unambiguous, precise definition. He called geometry and other mathematical sciences precise, and natural sciences descriptive, although he believed that they were closely related. But, despite these connections, none of the groups of sciences can replace the other. The Ukrainian natural scientist and thinker Volodymyr Vernadskyi, who was one of the first in world science to realize the importance of theoretically mastering the problems of scientific knowledge, researching the phenomenon of science by the means of science itself, also worked on the problems of classification of scientific knowledge. His contribution to the formation of this discipline retains its significance to this day. A special role belongs to his work "Scientific Thought as a Planetary Phenomenon", in which V. Vernadsky considered the key problems of the development of natural science, the separation and integration of its branches and the formation of new interdisciplinary sciences on this basis (physical chemistry, chemical physics, biochemistry, biogeochemistry, etc.). He considered any classification of sciences conditional, but necessary for defining the subject areas of their research.

The classification of sciences according to the subject of research, according to which mathematical, physical, chemical, biological, technical, social sciences, etc. are separated, is considered traditional. Another example of the traditional classification of sciences is their division, depending on knowledge and practical action, into theoretical (physics, chemistry, astronomy, biology, mathematics, etc.) and applied (radio engineering, mining, agrochemistry, medicine, etc.). This approach was shared by the German-American philosopher and sociologist Erich Fromm, who believed that science should be differentiated by establishing objectively correct norms of knowledge extraction. According to him, pure, i.e. theoretical, sciences deal with the discovery of facts and principles, and applied sciences are oriented towards practical norms, according to which one should act. At the same time, the norm itself is set by scientific knowledge of facts and principles.

Given the nature of scientific research and methods of obtaining knowledge, the German scientist V. Stoff classified sciences into empirical and theoretical. He included all types of cognitive activity, methods, techniques, ways of knowing, as well as forms of fixation, expression and consolidation of knowledge, which are the content of practice or its direct result, as empirical ones.

Researcher B. Biryukov classified the sciences according to the methods used in scientific research (descriptive, empirical, experimental, deductive, exact, etc.), according to their relation to practice (theoretical, "pure" and applied) and according

to the use of mathematical methods (deductive and non-deductive).

The classification of sciences proposed by H. Vollmer was based on the criteria of their functions in the system of scientific knowledge, distinguishing the sciences of reality, structural sciences, and the purpose of the discipline. He included physics, chemistry, psychology, and linguistics among the sciences of reality, calling them natural sciences, sociology and other humanities - cultural sciences. Vollmer considered logic, mathematics, computer science, automata theory, cybernetics, systems theory, game theory, and the theory of formal languages to be sciences of structures (formal systems). Metasciences (cognitive sciences and theories) - theory of science and semiotics. In his opinion, normative (law, ethics, aesthetics), historical (history, archeology, interpretation of philosophical texts) and applied sciences (medicine, technology, psychiatry, pedagogy) were outside this classification.

In Ukraine, there is a state system of organization and management of scientific research and provides an opportunity to concentrate and direct science to the fulfillment of the most important tasks, based on the needs of the socio-economic development of the state. The state system of science management aims to develop strategic and tactical solutions for the implementation of fundamental and applied research, increase their efficiency, select the most promising scientific topics, provide research information, and economically stimulate their activity.

The legislative basis for the organization of science is created by the Verkhovna Rada of Ukraine. The executive body that develops and implements measures to implement a unified policy in the field of science is the Cabinet of Ministers of Ukraine, which is subordinated to institutions and organizations that carry out direct management of scientific activities in the state: the Ministry of Education and Science of Ukraine, the National Academy of Sciences of Ukraine, branch academies of sciences , sectoral and inter-sectoral ministries, committees and departments.

The organization of science in the state includes four main sectors:

1) ***academic***- aimed at providing fundamental research that leads to new knowledge, ideas and theories;

2) ***university***- aimed at providing fundamental and applied research that provides new knowledge and developments suitable for practical application;

3) ***industry***- aimed at conducting applied research and implementation of developments and innovations;

4) ***industrial***- related to the introduction of scientific and technical developments, improvement of equipment and technologies, thanks to which inventions are made, new equipment and new products are created. Direct scientific activity in Ukraine is carried out by:

- *research and design institutions and centers of the National Academy of Sciences;*
- *research institutions of the system of branch academies of sciences;*
- *research units and departments of higher educational institutions (institutes, academies, universities);*
- *research, design, construction, technological and other institutions of ministries and agencies;*

- *research, design institutions and centers at industrial enterprises and associations;*
- *research, design, technological and other institutions and centers created on a commercial basis.*

The specified set of scientific institutions and organizations forms the organizational system of science in the state. The hierarchical structure of this system is crowned by the Ministry of Education and Science of Ukraine. It is the highest state body that solves the task of comprehensive use of the achievements of science and technology in all branches of social production.

The exclusive competence of the Ministry includes carrying out scientific and technical forecasting, ensuring the concentration of resources of academic, university and branch science in priority areas of scientific and technical progress, managing the state system of scientific and technical information, deepening scientific and technical cooperation with other countries of the world. The Ministry is the highest functional body of the state management of science, which is empowered to implement scientific policy, plan, forecast and control the scientific activity of all scientific institutions and organizations of Ukraine.

In the system of state organization of science, an important place belongs to the Department of Personnel Attestation (DAK of Ukraine), which is a structural subdivision of the Ministry of Education and Science of Ukraine and manages the attestation of highly qualified scientific personnel, ensuring the unity of requirements for candidates and doctor of science degrees, and monitors the quality of dissertation works , their scientific and practical significance, thereby participating in the formation of the scientific potential of the state.

The main task of the personnel certification department is to participate in: forming and ensuring the functioning of the scientific personnel certification system; formation of a network of specialized scientific councils and analysis of their activities; the formation of a network of expert councils for the examination of dissertation works and the organization of examination of dissertations in order to establish their compliance with state requirements for obtaining the scientific degrees of doctor, candidate of sciences.

Personnel Certification Department in accordance with the tasks assigned to it: participates in the Main Scientific Center of Ukraine - the National Academy of Sciences. Granting it the rank of the highest scientific institution of Ukraine is due to the objective needs of society in deepening and systematic development of fundamental problems in the field of social life, natural science and technology. It has historical prerequisites enshrined in the legal status of the Academy and is based on the material and technical support of the state. The National Academy, as a specialized higher sectoral body of science, coordinates all scientific research in Ukraine. As a scientific center, the Academy began its activities on November 27, 1918 (since 1921 - the All-Ukrainian Academy of Sciences - VUAN, since 1936 - the Academy of Sciences of the Ukrainian SSR, since 1937 - the Academy of Sciences of the Ukrainian SSR, now - the National Academy of Sciences of Ukraine) - on this day, Hetman Skoropadskyi signed a decree on the creation of the Ukrainian Academy of Sciences.

The presidents of the Academy during all the years of its existence were V. Vernadsky (1919-1921), V. Lepsky (1922-1928), D. Zabolotny (1928-1929), O. Bogomolets (1930-1946), O. Palladin (1946-1962), from 1962 - B. Paton.

The purpose of the National Academy of Sciences of Ukraine is defined in its Charter:

- *development of fundamental research in the leading areas of social and natural sciences;*
- *implementation of promising scientific research directly related to the development of production, first of all in the defining branches of technical progress;*
- *identification of fundamentally new opportunities for scientific and technical progress and preparation of recommendations for their application in the national economy;*
- *studying and summarizing the achievements of world science and promoting their most complete implementation in social practice.*

The National Academy of Sciences unites outstanding scientists of Ukraine.

The main link of the structure of the National Academy of Sciences of Ukraine are research institutes and scientific institutions equivalent to them.

In the structure of the National Academy of Sciences of Ukraine there are national institutions - the National Library of Ukraine named after V. I. Vernadskyi, National Scientific Center "Kharkiv Physical and Technical Institute", National Historical and Archaeological Reserve "Olvia", National Botanical Garden named after M.M. Hryshka, Sofiivka National Dendrological Park, National Science Museum, Lviv National Scientific Library of Ukraine named after V. Stefanyka, National Center "Small Academy of Sciences of Ukraine" MES of Ukraine and NAS of Ukraine.

In addition to the National Academy of Sciences, there are national sectoral academies of sciences in Ukraine: the National Academy of Agrarian Sciences, the National Academy of Medical Sciences, the National Academy of Arts, the National Academy of Pedagogical Sciences, and the National Academy of Legal Sciences.

Academy of Pedagogical Sciences. The total number of members of the National Academy of Sciences of Ukraine is 154, of which 63 are active members (academics) and 91 are corresponding members. In addition, 35 foreign members, 10 honorary academicians were elected to the Academy. 1,329 scientists work in scientific institutions, including 222 doctors and 529 candidates of sciences. Scientific and scientific-practical employees of institutions and members of the Academy perform 283 scientific research works in 40 scientific directions.

The Academy includes: Institute of Pedagogy, Institute of Psychology named after H.S. Kostyuk, Institute of Pedagogical Education and Adult Education, Institute of Educational Problems, Institute of Special Pedagogy, Institute of Social and Political Psychology, Institute of Higher Education, Institute of Information Technologies and Teaching Aids, Institute of Vocational and Technical Education, Institute of the Gifted Child, State Higher Educational Institution "University of Education Management", Ukrainian Scientific and Methodological Center of Practical Psychology and Social Work, Educational and Scientific Center of Vocational and Technical Education, Lviv Scientific and Practical Center of

Vocational and Technical Education, Scientific and Methodological Center of "Ukrainian Ethnopedagogy and Folklore" (Ivano-Frankivsk), the Crimean Scientific and Methodological Center for Education Management (Simferopol), the Southern Scientific Center (Odesa), the State Scientific and Pedagogical Library of Ukraine named after V.O. Sukhomlynskyi, Pedagogical Museum of Ukraine, "Pedagogic thought" publishing house.

Experimental sites of the Academy for researching specific problems of education and upbringing are schools, pre-school and out-of-school institutions, vocational schools, higher educational institutions in different regions of Ukraine. NAPN has more than 400 experimental educational institutions. According to the main tasks of the Academy:

- *organizes, coordinates and conducts fundamental and applied scientific research on the problems of education, pedagogy and psychology, informs the public about their results;*
- *develops the scientific foundations of education development taking into account scientific and technical progress, socio-economic changes, national and cultural traditions, as well as foreign experience;*
- *develops pedagogy, psychology and other sciences, conducts interdisciplinary research;*
- *conducts scientific examination of educational innovations and educational literature, studies and summarizes the achievements of pedagogical and psychological sciences, promotes their implementation in practice;*
- *unites scientists of the Academy, other scientific institutions, scientific-pedagogical and pedagogical workers of higher educational institutions in scientific councils, societies and associations;*
- *establishes ties with scientific institutions of other states on education issues;*
- *conducts training of highly qualified scientific and scientific-pedagogical personnel and carries out experimental educational activities;*
- *organizes and carries out advanced training of employees of scientific institutions, scientific-pedagogical and pedagogical employees in pedagogy and psychology and methods of individual disciplines, managerial employees, their reserve, as well as employees of methodical services and institutions of postgraduate pedagogical education, practical psychologists;*
- *conducts publishing activities;*
- *convenes scientific sessions, congresses, conferences and meetings, including international ones, to discuss scientific problems and issues of coordination of scientific research work;*
- *promotes the creation of enterprises for the preparation of didactic materials and the provision of scientific and technical and scientific and methodological services, the development of various forms of innovative activity and international scientific and technical cooperation in the field of education and pedagogy.*

Materials for self-control:

AND. Questions for self-control:

B. Test tasks and problems

Summing up.

List of recommended literature

Main:

1. Gutorov O.I. Methodology and organization of scientific research: study guide. Kharkiv: KHNAU, 2017. 272 p.
2. Danilyan O.G., Dzoban O.P. Organization and methodology of scientific research: teaching. manual Kharkiv: Pravo, 2017. 448 p.
3. Degtyarev A.V., Kokodiy M.G., Maslov V.O. Fundamentals of scientific research: a study guide. Kharkiv: KHNU named after V. N. Karazina, 2016. 78 p.
4. Kostyukevich V.M., Konnova M.V. Methodology of scientific research: study guide. Vinnitsa. 2017. Vol. 172.
5. Malyhina V.D. Methodology of scientific research. Rivne. 2016. 247 p.
6. Methodology of scientific research: teaching manual. / V.I. Zatserkovnyi, I.V. Tishaev, V.K. Demidov – Nizhyn: NSU named after M. Gogol, 2017. – 236 p.
7. Methodology of scientific research in medicine: teaching. manual / V.D. Babajan, N.S. Bakumenko, O.I. Kadykova and others; under the editorship P.G. Kravchuna, V.D. Babajana, V.V. Meat eater. – Kharkiv: KhNMU, 2020. – 260 p.

Additional:

1. Dobronravova I. S. Philosophy and methodology of science: textbook / I. S. Dobronravova, L. I. Sydorenko. - K.: Kyiv University, 2008. - 223 p.
2. Lesyn V.M. How to work with a book: a method. manual - K.: Vyshcha Shk., 1998. - 71 p.
3. Sharapov O. D. System analysis: teaching method. manual / O. D. Sharapov, V. D. Derbentsev, D. E. Semenov. - K.: KNEU, 2003. - 154 p.
4. Tsokur O.S. Diary of research practice / O.S. Tsokur - O., 2018. - 20 p.
5. Tsokur O.S. Methodical recommendations for writing a master's thesis, specialty 011 Educational, pedagogical sciences / O.S. Tsokur - O., 2018. - 31 p.

Electronic information resources:

1. Methodical recommendations for writing a research paper. – Access mode: http://nmc.at.ua/load/normativno_pravove_zabezpechennjametodichnoji_roboti/instrukciji_rekomendroboti/6-1-0-41
2. How to correctly draw up a list of references for a scientific paper. - Access mode: http://www.library.ukma.edu.ua/?id=214
3. Analysis of literary sources and documents. – Access mode: http://pidruchniki.com/1444072861412/pedagogika/analiz_literaturnih_dz

Practical lesson #2

SUBJECT: "Scientific information: search, accumulation, processing. Planning of research work" - 2 hours

Goal:familiarity with information publications, which contain operational systematized information about documents (published, unpublished), the most essential aspects of their content.

Basic concepts:

Term	Definition
Primary information	is the source information that is the result of direct sociological, experimental research, study of practical experience.
Secondary information	is the result of analytical and synthetic processing of primary information.
Program of scientific research	— specified wording of the topic; the status of the issue and justification of the chosen field of work; content, objects and research methods; stages of work with an indication of the content and completion date of each stage (calendar work plan).

Actuality of theme

Work planning implies the need to choose a research methodology, calculate the volume of observations or the number of experiments, determine how much time is needed to complete the work.

Primary and secondary information is of particular importance for writing a dissertation, as it serves as a theoretical and experimental basis for achieving the goal of the research and solving its tasks. It is proof of the validity of the scientific provisions of the dissertation, their reliability and novelty.

Plan

I. Organizational moment (greetings, checking those present, announcing the topic, the purpose of the lesson, motivating students to study the topic).

II. Control of basic knowledge: Theoretical questions for the lesson:

III. Formation of professional skills and abilities. Practical works (tasks) performed in class:

- Description of the research process;
- Designing the research results;
- Program of scientific research.

Topic content:

Subsystem of information about the research object

The responsible stage of scientific research is the acquisition and analysis of primary and secondary information on the research topic.

Primary information is source information that is the result of direct sociological, experimental research, study of practical experience.

Secondary information is the result of analytical and synthetic processing of primary information.

Primary and secondary information is of particular importance for writing a dissertation, as it serves as a theoretical and experimental basis for achieving the goal of the research and solving its tasks. It is proof of the validity of the scientific provisions of the dissertation, their reliability and novelty.

Authenticity is sufficient correctness, something that does not cause doubts, proof that the named result (law, regularity, set of facts, etc.) is true, true. Reliability is the repeatability of the result under the same conditions in many tests on many objects.

The validity of the results and conclusions of the dissertation is substantiated by an experiment, a logical proof, an analysis of literary and archival sources, and a test in practice. There are three groups of methods of proving reliability: analytical, experimental, and confirmed by practice.

Analytical methods belong to the most important methods of scientific knowledge. Their essence is the proof of the result (law, regularity, formula, concept) through logical, mathematical transformations, analysis of statistical data, published and unpublished documents. The essence of experimental reliability testing methods is to conduct scientific experiments and compare theoretical and experimental results. When comparing scientific results with practice, it is necessary to match the provisions derived in theory with the phenomena observed in practical situations.

The description of the research process is the main part of the dissertation, which provides an overview of the main sources on the research topic, highlights the methodology and technique of research using logical laws and rules. It is important to choose research methods that are a tool for obtaining actual material or primary scientific information and are a necessary condition for achieving the goal set in the dissertation.

The subsystem of information about the object (subject) of research is a systematic activity for obtaining information necessary for solving its purpose and tasks. It includes the selection of sources on the topic of research, their analysis, the choice of methods, data collection, their processing and analysis to obtain information (primary and secondary) to solve a specific problem. This process can be presented in more detail in the form of a diagram (Fig. 1).

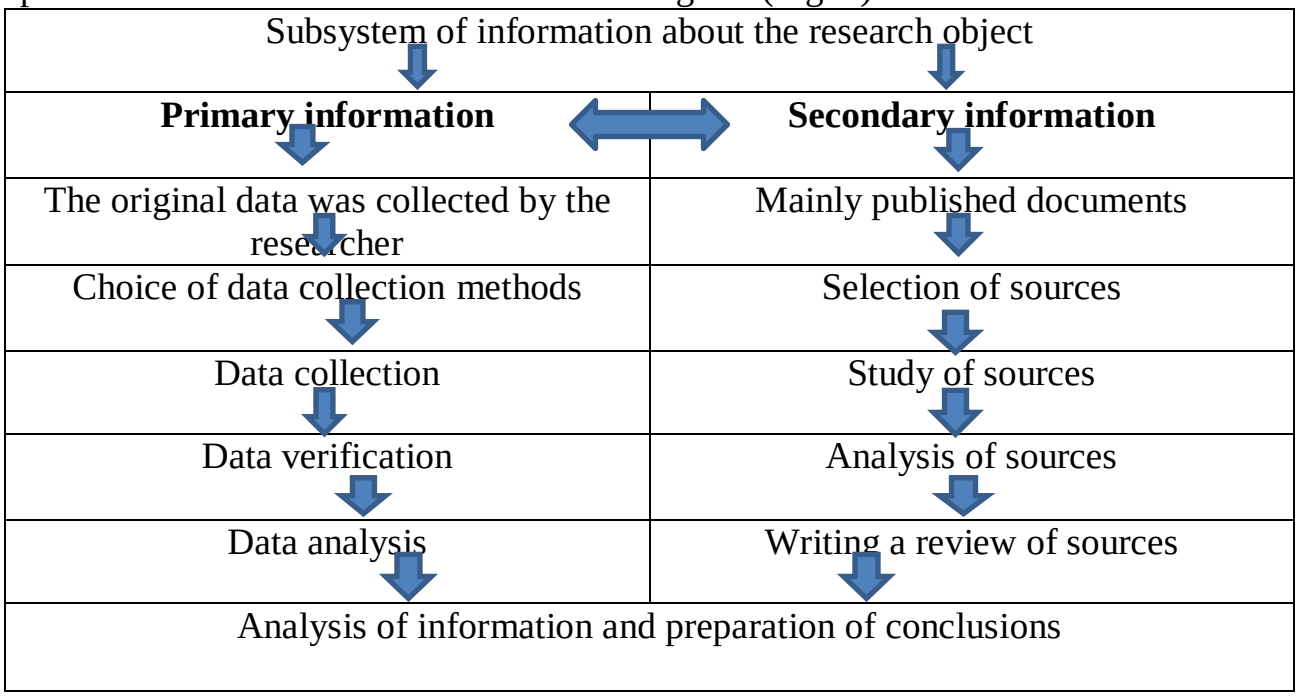


Fig. 1. General scheme of the process of collecting and analyzing scientific

information
To obtain the necessary information on a certain topic, it is necessary to implement the following stages (partial actions). 1. Development of the research concept.
1.1. Determination of the purpose and tasks of the research.
1.2. Formulation of the problem.
1.3. Formation of a working hypothesis.
1.4. Definition of the system of indicators.
2. Obtaining and analyzing secondary information.
3. Obtaining and analyzing empirical data.
3.1. Development of tools for research.
3.2. Data acquisition process.
3.3. Data processing and analysis.
4. Formation of main conclusions and design of research results.
4.1. Preparation of conclusions and recommendations.
4.2. Designing the research results. The process of accumulating and processing scientific information includes the following components:
problem definition— formation of the object (subject) of research. It is necessary to conduct a preliminary study, that is, to clearly define the topic, using informal analysis. Then — final research, that is, structured data collection and analysis to solve a specific task;
analysis of secondary information(i.e. published information on the research topic);
obtaining primary information(i.e., only received data for solving a specific task or question);
conclusions and recommendations(that is, conclusions obtained on the basis of the analysis of literary sources and collected data);
use of results(the possibility of using the results both now and in the future).
Thus, the information subsystem includes systematic collection, processing, analysis and generalization of both primary and secondary scientific information on the research topic. Each of the components of collecting and processing information on the topic has its own characteristics. Therefore, let's dwell on them in more detail.

Search for secondary documentary information on the topic

Knowledge of published (secondary) sources of information on the topic of research is an indispensable condition for ensuring the quality of scientific research. It allows a deeper understanding of the scientific material contained in the published works of other scientists, since the main questions of the problem are almost always presented in earlier studies.

Search, processing, and analysis of published sources make it possible to identify the level of research on a specific topic, prepare a review of the literature on the topic, and create a list of used sources (approximately 200-250 titles).

To compile a list of sources on the selected topic, it is advisable to use systematic catalogs available in libraries, in which the titles of works are arranged by fields of knowledge; alphabetical catalogs, in which cards for books are arranged in alphabetical order of authors' surnames or titles; subject catalogs containing titles of works on specific problems and questions; various bibliographic and reference publications (manuals and indexes on individual topics and sections), footnotes and

references in monographs, textbooks, encyclopedias, encyclopedic dictionaries, etc. The main periodicals on the selected issue should be identified. When selecting the main materials, you should refer to the indexes of articles published during the calendar year and placed at the end of the last issue of the journal for each year of publication.

Next, you should create a file (or list) of literary sources on the topic. A well-made card file (list) helps to cover the topic as a whole, even with a cursory review of source names. On its basis, it is possible to clarify the structure of the dissertation at the very beginning of the research.

All types of sources, the content of which is related to the topic of the dissertation research, must be reviewed. These include materials published in various domestic and foreign publications; unpublished documents (reports on research and development works, dissertations, deposited manuscripts, reports of specialists on international business trips, materials of foreign companies, etc.), official documents.

Determining the state of study of the topic is expedient to begin with familiarization with information publications that contain operational systematized information about documents (published, unpublished), the most essential aspects of their content. Information publications, unlike ordinary bibliographic guides, include not only information about printed works, but also the ideas and facts contained in them. In addition to efficiency, they are characterized by the novelty of the information provided, complete coverage of sources and the presence of a reference apparatus, which facilitates the search and systematization of literature.

Information publications are issued by institutes, scientific and technical information services (NTI), information centers, libraries. They cover all branches of the national economy.

The main institutes and organizations of Ukraine that carry out the centralized collection and processing of the main types of published documents include: the Book Chamber of Ukraine, the Ukrainian Institute of Scientific, Technical and Economic Information (UkrINTEI), the National Library of Ukraine named after V.I. Vernadskyi and other library and information institutions of the national or regional level.

The bulk of the manuals of the above-mentioned institutes and organizations are divided into three types: bibliographic, abstract and overview.

Bibliographic editions contain an organized collection of bibliographic records, showing what was published on a subject of interest to specialists. Bibliographic descriptions perform two functions. They notify about the appearance of a document (signal function) and provide the necessary information about its location (address function). Indexes and bibliographic lists are compiled from bibliographic records.

Bibliographic indexes are most often indicative and consist of a list of bibliographic entries, often without annotations and abstracts. These editions provide the most complete information about the release of domestic and foreign literature into the world. They are characterized by the efficiency of preparation in a relatively short period of time from the time of the publication to its display in the index.

Help in searching for literary sources is provided by reference editions, which contain publications of abstracts, which include an abbreviated summary of the

content of primary documents (or their parts) with the main factual data and conclusions. Abstract publications include abstract magazines, abstract collections, express information, information leaflets, etc. As a rule, these publications most fully reflect all documents from a specific field, both published and unpublished (RZ "Economics. Economic Sciences", "Politics. Political Sciences", etc.).

When selecting literary sources, researchers should pay special attention to publications of the Book Chamber of Ukraine:
bibliographic indexes "Chronicle of books", "Chronicle of newspaper articles", "Chronicle of magazine articles", "Chronicle of sheet music", "Chronicle of visual publications", "Chronicle of reviews", "New publications of Ukraine", "Periodical and continuing publications" and others.

Along with the information publications of the NTI bodies, automated information and search systems, databases and data banks, and the Internet should be used for information search. Search data can be used directly, but more often they serve as a stepping stone (key) to identifying primary sources of information, which are scientific works (monographs, collections) and other publications necessary for scientific work.

Retrospective bibliography, the purpose of which is the preparation and distribution of bibliographic information about printed works for a certain period of time in the past, is of particular importance for the search and analysis of literature published in past years. The retrospective bibliography is represented by a wide range of manuals. Among them are thematic indexes and reviews, in-book and supplemental lists of literature, catalogs, price lists of publishers, personal and regional bibliography, etc. Thematic indexes and reviews are the main part of retrospective publications.

Extensive use of bibliographic indexes, databases and data banks, as well as Ipiegpeti will ensure the completeness of the selection of published and unpublished sources on the researched topic.

Analysis of scientific literature on the topic

Scientific research is based on the achievements of science. It is no coincidence that every article, brochure, book includes references to previous research. The report, essay, dissertation should also contain a review of the literature on the topic. In a dissertation study, the analysis of scientific literature performs the following functions:
1) reveals the achievements of science, its achievements and shortcomings. Errors and gaps;
2) contributes to the identification of the main trends in the views of specialists on the problem in view of what has already been done in science
3) makes it possible to determine the relevance and level of development of the problem studied by the researcher;
4) provides material for choosing aspects and directions of research, its purpose and tasks, as well as theoretical constructions;
5) ensures the reliability of the conclusions and results of the acquirer's searches, the connection of his concept with the general development of the theory.

During the preliminary study of the literature, the applicant gets acquainted

with the state of science in general and the development of a specific issue in particular, writes down ideas that can become basic, generalizing about this problem (what is common, how do the approaches of scientists differ), gives an accurate definition of concepts.

It is believed that the study of the literature on the chosen topic should begin with general works in order to have an idea about the main issues close to the research topic, and then conduct a search for new literature. Moreover, at the first stage of information accumulation, one should cover as many sources as possible, and then gradually "screen out" redundant publications. However, a more productive method is to deliberately limit the range of sources from the very beginning of work on the dissertation, and the study begins with those that are directly related to the topic of the dissertation. Experience shows that the study of an excessive range of sources leads to an excess of information, for a long time inhibits the solution of a specific scientific problem (task) of the dissertation research.

The selection and study of literary sources can be accelerated by a clear orientation of the applicant to the main sections and subsections of the dissertation, in which specific research tasks will be solved within the main goal. You can develop a detailed questionnaire within each task in order to consistently get answers to the questions that need to be addressed.

The method of reading scientific literature is significantly different from reading fiction. There are two types of reading: "fast" and "slow". The first allows the researcher to answer the question whether a given book or article should be read carefully. The second involves an in-depth study of sources, moving from simple to complex material, from books to articles, from domestic to foreign sources.

Each article or monograph should be read with a pencil in hand, and notes should be taken. If you have your own copy or photocopies of a magazine, book, or article, you can make marks in the margins. This will significantly facilitate the further analysis of the literature.

A step-by-step study of scientific publications is generally recognized:

- general acquaintance with works as a whole according to their content (list of sections and subdivisions);
- a cursory review of all content;
- reading according to the sequence of placement of the material;
- selective reading of a certain part of the work;
- writing out that part of the material that interested you;
- critical evaluation of the recorded, its editing, recording as a fragment of the text of the future dissertation (articles, monographs).

There is another way of studying. A notebook page is divided in half by a vertical line. On the left side, they make extracts from what they have read, and on the right side, they make their comments and, highlighting under the drawings, words or sentences that have a particularly important meaning. It is necessary to indicate not

only the bibliographic description of the sources, but also the codes of the subject headings that correspond to certain sections and subdivisions of the dissertation.

This method is easy to implement on a personal computer. There are special programs for this. The text is scanned and converted to plain text format using RipeEaaeg 4.0. After that, it can be easily processed, edited, sorted. The material can be output to the printer.

Literature is studied not to borrow material, but to think over the information found and develop one's own concept. When working on other people's texts, one should record one's own thoughts, these are ideas that arose during acquaintance with the works of domestic and foreign authors. This will serve as a basis for acquiring new knowledge.

When studying the literature on the chosen topic, not all the information contained in it is used, but only that which is directly related to the topic of the dissertation. Therefore, the criterion for evaluating what has been read is the possibility of its use in the dissertation.

When studying literary sources, it is necessary to carefully monitor the design of notes so that they are easy to use in the future. A full bibliographic description of the sources should be given, indicating both the general volume of the publication and the specific page on which the valuable material is contained.

Special attention is paid to research terminology. In order for the conceptual apparatus to be scientifically based, it is necessary to analyze the definitions of concepts by various scientists and compare them with those formulated in state standards, encyclopedias, encyclopedic dictionaries, both general and branch. It is important to do this because every science has its own scientific language. Terms and concepts in everyday language often do not correspond to their scientific interpretation. Sometimes a novice researcher tries to write an article or a dissertation without appropriate theoretical training, which causes misunderstanding and indignation among specialists.

When analyzing the literature, only scientific facts should be selected. A scientific fact is an element that underlies scientific knowledge and reflects the objective properties of processes and phenomena. On the basis of scientific facts, regularities of phenomena are determined, theories are developed and laws are derived.

Scientific facts are characterized by such properties as novelty, accuracy and objectivity and reliability. The novelty of a scientific fact indicates a fundamentally new, hitherto unknown object, phenomenon or process. This is not necessarily a scientific discovery, but it is always new knowledge about what was previously unknown. Knowledge of new facts expands the perception of reality, enriches opportunities for its change, improvement, etc.

When selecting facts, one should be scientifically objective. Facts cannot be dismissed simply because they are difficult to explain or practically apply. Especially important are those that confirm the main idea, the researcher's concept. Scientific facts should be carefully studied in order to make timely corrections to one's research position.

The reliability of scientific facts largely depends on the reliability of primary sources.

It is obvious that the official publication, which is published by state or public organizations, institutions and departments, contains materials whose accuracy should not cause doubts.

The level of credibility of scientific publications depends on many factors, in particular, on the purpose and nature of the information. If we compare different types of publications, they can be placed in the following sequence in order of decreasing credibility: descriptions of inventions and patents, scientific monographs, scientific collections of articles, scientific collections of conference materials; scientific and technical articles, humanitarian articles, informative articles, etc.

Theoretical articles in the field of technical and other exact sciences are characterized by the special accuracy of evidence and the use of modern mathematical modeling methods with the involvement of experimental research data. The information in such an article is sufficiently substantiated. The results of calculations and experiments, their evaluation data, methods, conditions for solving the problem, as well as other information — all this is reliable.

A theoretical article in the field of humanities is much more than a scientific and technical one, full of reflections, comparisons, and verbal evidence. The reliability of its content depends on the reliability of the source information used. However, the position of the author, his worldview, is important here; depending on this, the article, along with objective scientific data, may contain unsubstantiated interpretations, false statements, and various inaccuracies. It is very important to pay attention to these features of humanitarian articles, to accurately establish the truth of the judgments of the author of the article and give them an appropriate assessment.

The reliability of the source information can be evidenced by data on what results are given in the publication - completed or incomplete research, as well as the scientific and professional authority of the author, his affiliation to a particular scientific school. It is necessary to select the most authoritative sources containing the latest data, to indicate exactly where the material is taken from. However, when selecting materials from literary sources, one should approach them critically, regardless of the author's level of authority.

A special form of factual material is citations, which fit organically into the text of the dissertation when analyzing the author's positions. They are used in order to convey the opinion of the author of the original source without distortions, to identify views when comparing different points of view, etc. Based on their content, the author of the dissertation performs an analysis and synthesis, builds a system of substantiated evidence. Quotations are also used to confirm individual judgments expressed by the recipient. The following rules should be followed when citing sources:

- citations must be accurate;
- the main meaning of the author's views cannot be distorted;
- the use of quotations should be optimal, i.e. determined by the needs of developing the dissertation topic;
- it is necessary to specify the source of the citation;

- citations should organically "fit" into the context of the dissertation.

Along with direct quotation, retelling of the text of the original source is often used. In this case, the text of the transfer is carefully compared with the original source.

One of the main results of the analysis is a review of the literature on the research topic. It is unethical to provide specific proofs of the correctness of certain views of the founders of scientific thought, classics of a specific field of science, since the truth of their scientific ideas has already been proven by the entire history of science. The research may use the statements of certain founders of the scientific school as starting points. It can be noted, in connection with which these or other provisions, opinions of the classics of science have become especially relevant or have acquired a different, more important meaning these days. If the acquirer does not agree with the positions of the predecessors, then it is necessary not only to criticize, but also to give reasonable evidence of the incorrectness of the approaches.

Analysis of scientific literature requires a certain culture of the researcher. First of all, all the names of the authors who hold the same views on this or that issue are listed in alphabetical order. After all, it is difficult to determine which of the scientists made a greater contribution to the development of this or that issue. The alphabetical order emphasizes the same attitude of the researcher to the scientific concepts of scientists, although the acquirer can pay attention to the fact that this question was first raised by such and such a scientist, that this researcher made the greatest contribution to this aspect of science, etc.

The most difficult is the procedure of systematization of scientific literature during its review and analysis. Sometimes, even in a dissertation or monograph, a primitive type of literature analysis can be observed: it is briefly reported that in such and such a work, such and such a scientist presented such and such a position, and the second - another. A chronological list of who and what was said on this or that occasion cannot be considered a scientific analysis of literature. It is also inappropriate to annotate works on a topic without presenting the researcher's own position.

To avoid these mistakes, you should carefully read the literature and systematize the views of scientists in the following order:

- the essence of this phenomenon or process (the position of several authors coincides in this or that aspect);
- what is the content of this process or phenomenon (its components, chains, stages, stages of development);
- the views of scientists regarding the ways to solve this problem in practice (who developed it and which direction);
- what difficulties, revealed in previous studies, occur during the practical solution of the task;
- what factors, conditions for the effective development of a process or phenomenon in this field have been identified by scientists.

Based on the literature analysis, a review of the literature by topic is compiled, the topic, object and subject of the research are specified. A brief critical analysis of the literature and a comparison with known solutions to the problem (scientific task) are provided in the introduction to the dissertation in order to substantiate the relevance and expediency of the work for the development of the relevant field of science or production, especially for the benefit of Ukraine. A review of the literature on the topic is also presented in the first chapter of the main part of the dissertation when choosing research directions. If many important studies have been conducted on this problem over a long period of time, the scientific analysis of the sources should be especially deep and complete. In addition, the literature review is carried out in order not to repeat known positions.

The review of the literature on the topic at the final stage of the research is designed not only to connect the conducted research with the general state of science, but also to compare the results obtained with the data of other researchers, the point of view of the acquirer with the views of other scientists, to determine general trends in science, to confirm the relevance of the topic and reliability facts and theories of the acquirer. After the research is completed, the analysis of the literature, as a rule, is deepened, as it becomes possible to more reasonably explain the fallacy of the views of certain scientists. A review of sources makes it possible to identify a new scientific direction that requires dissertation research.

The main tasks of the literature review:

familiarization with materials on the topic of the dissertation, their classification, selection of the most valuable research, basic, fundamental works, basic results. At the same time, one should study the literature not only on a narrow topic, but also on broader topics close to the research topic. This will make it possible to give a general description of the field of research, its importance for the development of science and practice, the relevance of the topic; identification of the main circle of scientists who studied the topic, study of their contribution to the development of the problem; identifying the most interesting, but insufficiently covered areas of research that could become the topic of a dissertation.

It is necessary to identify and analyze different points of view on solving the problem, give an assessment, suggestions, remarks;

providing a list of unresolved issues;

formulation of the main directions of the dissertation work: their relevance and ultimate goal, tasks, aspect of consideration.

The following basic criteria for the correctness of writing a review should be taken into account:

- the review is written not according to the authors, but according to the tasks
- research;
- the review should reveal the professional competence of the applicant, his personal contribution to the development of the topic compared to already known research;
- the review is written correctly if it can be published as an independent article.

Acquisition and analysis of primary information

Primary information, which is a component of the information subsystem, is important for confirming the reliability of research conclusions and results, testing the working hypothesis, and specifying the problem.

*Working hypothesis of the research*is a kind of algorithm for solving the researched topic; it helps to establish the boundaries and main directions of research. The working hypothesis should ensure reliability, predictability, verification of provisions on empirical material.

The working toolkit used in scientific research is a set of methods and means of collecting, processing and analyzing information to test the working hypothesis of the study. It includes a set of methods and procedures for collecting primary data, tools for processing the received data, and methods for analyzing and summarizing materials for testing working hypotheses. A special place is occupied by special sample studies (surveys of the population, specialists, expertise) (Table 1).

Several methods of obtaining data can be used to collect primary information: survey, observation, experiment, panel, testing, questionnaire, etc. Each of the above-mentioned methods can be implemented with the help of a source of information suitable only for this method: questionnaire, questionnaire, test.

Primary and secondary information collected as a result of the research is processed using modern statistical methods and models. The main results of research — conclusions and recommendations — should be well-argued and reliable. The essence of the conducted research is presented in the first chapter of the main part of the dissertation, which highlights the purpose of the research, for whom and how it was conducted, the characteristics of the sample, the term about For details on the methods and technology of conducting sociological research, see in the relevant sections. Introduction, methods of collecting information, sources of obtaining information. The questionnaire itself and other tools are provided in the appendices.

Table 1. Methods and means of data collection for testing the working hypothesis

1. Who collects the data?	The researcher can do it independently or involve third parties (institutions, organizations)
2. What information must be collected?	The types and volumes of the necessary information are determined by the subject of the research, the purpose and tasks formulated in the dissertation
3. Who and what is supposed to be investigated?	It is necessary to determine the research objects, the order of data collection. There are two approaches to sampling that have been used for large and dispersed populations; — likely; — deterministic (elements are chosen for reasons of convenience or the decision made) The sample size should be determined

4. What collection methods should be used?	The main types: survey — systematic collection of information from respondents using: direct survey, survey by phone, mail. The survey can be open (the real purpose of the research is indicated) or hidden (the real purpose is not communicated). This way you can get more honest answers; observation is an analytical method by which current behavior and the result of past behavior are studied and recorded (mainly in real situations); an experiment is a type of research when one or more factors are changed under controlled conditions; simulation is a computer-based method that reproduces the application of various factors on paper, rather than in real conditions: a) a model of controlled and uncontrolled factors is built; b) various connections are put into the computer; c) the impact on the overall research strategy is determined
5. How much will the research cost?	It should be clearly defined; general and specific research costs; time (of respondents, researchers) spent on research; computer use; use of paper; means of encouraging respondents' responses (if provided)
6. How will the data be collected? (his capabilities, qualifications and competence)	6. Data collection can be carried out in two ways: — interviewers ask questions and observe behavior, record answers and behavior, and, if necessary, explain questions; — respondents read the questions and write their ANSWERS
7. What term should the Researcher determine how long he collects data?	will spend on research (prolonging the research may lead to incomparability of answers)

Collection, analysis and generalization of primary and secondary information on the topic of research ensure the scientific validity of theoretical or experimental results obtained personally by the acquirer and put forward by him for public protection.

Planning of research work

Work planning implies the need to choose a research methodology, calculate the volume of observations or the number of experiments, determine how much time is needed to complete the work.

Experience shows that no more than 2/3 of the total time spent on work should be spent on gathering material and its rough processing, and on writing and design of

work - no less than 1/3.

The choice of work methodology depends on the purpose and subject of the research.

The planning of scientific work includes: drawing up a preliminary plan, a refined plan, a work plan, a program of scientific research, a work program.

Preliminary plan —a list of the main problems in their logical sequence. It is based on a general idea of the subject of research, familiarization with the literature, lectures, specialist consultations, etc.

Refined plan— is developed on the basis of work on the topic, necessary for accumulating material, thinking about the topic, increasing the level of awareness of the performer.

Work plan —putting forward and substantiating the working hypothesis, ways of obtaining results, stages of work execution, terms of execution of research stages, work executors.

Program of scientific research— specified wording of the topic; the status of the issue and justification of the chosen field of work; content, objects and research methods; stages of work with an indication of the content and completion date of each stage (calendar work plan).

Components of a scientific research program: research task, general content, scientific and practical significance, idea, solution principle, research methodology, scope of work, deadline.

Planning of research work is important for its rational organization.

Scientific-research organizations and educational institutions develop work plans for the year on the basis of targeted comprehensive programs, long-term scientific and scientific-technical programs, business contracts and applications for research submitted by customers.

Research and educational institutions draw up work programs and plans-schedules for their implementation on the topics of research works.

Work program -it is an exposition of the general concept of the study in accordance with its goals and hypotheses. It consists, as a rule, of two sections: methodological and procedural.

Methodological sectionincludes:

1. formulation of a problem or topic;
2. definition of the object and subject of research;
3. definition of the goal and setting of research tasks;
4. interpretation of basic concepts;
5. formulation of working hypotheses.

*Problem formulation (topics)*is the definition of a problem that requires a solution. There are social and scientific problems.

*Definition of the object and subject of research.*The object of research is that social phenomenon (process) that contains a contradiction and creates a problematic situation. The subject of research is the most significant from the point of view of

practice and theory properties, sides, features of the object, which are subject to study.

*Determination of the purpose and tasks of the research.*The purpose of research is its general focus on the final result. A research task is something that requires a decision in the research process; questions that must be answered.

Interpretation of basic concepts- this is an interpretation, clarification of the meaning of basic concepts.

*Formulation of working hypotheses.*A hypothesis as a scientific assumption put forward to explain some facts, phenomena and processes is an important tool for successfully solving research tasks.

The research program can be focused on one or several hypotheses.

Procedural sectionwork program includes:

1. basic research plan;
2. an outline of the main procedures for collecting and analyzing empirical material. Specific scientific research is carried out according to a basic plan, which is built depending on the amount of information about the object of research. There are exploratory, analytical (descriptive) and experimental plans.

In the procedural part of the program, the choice of research methods is substantiated, the connection of these methods with the goals, tasks and hypotheses of the research is shown.

When choosing one or another method, it should be taken into account that it should be:

a) effective, that is, to ensure the achievement of the set goal and the required degree of research accuracy;
b) economic, i.e. allow to save time, effort and means of the researcher;
c) simple, i.e. accessible to a researcher with appropriate qualifications;
d) safe for the health and life of people;
e) permissible from the point of view of morality and norms;
e) scientific.

Materials for self-control:

AND. Questions for self-control:

B. Test tasks and problems

Summing up.

List of recommended literature

Main:

1. Gutorov O.I. Methodology and organization of scientific research: study guide. Kharkiv: KHNAU, 2017. 272 p.
2. Danilyan O.G., Dzoban O.P. Organization and methodology of scientific research: teaching. manual Kharkiv: Pravo, 2017. 448 p.

3. Degtyarev A.V., Kokodiy M.G., Maslov V.O. Fundamentals of scientific research: a study guide. Kharkiv: KHNU named after V. N. Karazina, 2016. 78 p.
4. Kostyukevich V.M., Konnova M.V. Methodology of scientific research: study guide. Vinnitsa. 2017. Vol. 172.
5. Malyhina V.D. Methodology of scientific research. Rivne. 2016. 247 p.
6. Methodology of scientific research: teaching manual. / V.I. Zatserkovnyi, I.V. Tishaev, V.K. Demidov – Nizhyn: NSU named after M. Gogol, 2017. – 236 p.
7. Methodology of scientific research in medicine: teaching. manual / V.D. Babajan, N.S. Bakumenko, O.I. Kadykova and others; under the editorship P.G. Kravchuna, V.D. Babajana, V.V. Meat eater. – Kharkiv: KhNMU, 2020. – 260 p.

Additional:

1. Puzanova O. G. Information provision of evidence-based health care. Part I. / O. G. Puzanova, T. S. Gruzheva // Proof. honey. – 2014. – No. 4 (16). - P. 23-33.

2. Skakun M. P. Fundamentals of evidence-based medicine: monograph / M. P. Skakun. - Ternopil: Ukrmedknyga, 2005. - 244 p.

3. Chernobrovy V. M. Health, pre-disease, disease: medical and social aspects and assessment. Risk factors. Preventive medicine: a guide for graduate students, interns, general practitioners - family medicine / V. M. Chernobrovyi, S. G. Melashchenko, T. M. Tkachuk. – Vinnytsia: Planer, 2013. – 80 p.

4. Shulyak V. I. International experience of using an integrated clinical protocol in medical practice (literature review) / V. I. Shulyak // Ukr. honey. magazine – 2010. – No. 5 (79). - P. 41-44.

5. Howick J. The Philosophy of Evidence-Based Medicine / J. Howick. - Oxford: Blackwell-Wiley, 2011. - 238p.

Electronic information resources:

1. Best Evidence. URL: http://www.bestevidence.com/
2. BritishMedicalJournal. url http://www.bmj.com/specialties/evidence-based-practice
3. CanadianMedicalAssociation. URL: http://www.cma.ca/
4. Center for Evidence-based Medicine at the University of Oxford. URL: http://www.cebm.net/
5. Clinical Evidence. URL: http://clinicalevidence.bmj.com/x/index.html
6. Cochrane Collaboration open learning material for reviewers. URL: http://www.cochrane-net.org/openlearning
7. Cochrane Library. URL: http://www.thecochranelibrary.com/
8. Current Controlled Trials. URL: http://www.controlled-trials.com/mrct
9. eGuidelines. URL: http://www.eguidelines.co.uk/
10. Evidence-Based Medicine. URL: http://ebm.bmj.com/
11. Canada Clinical Guidelines Database. URL: http://www.phac-aspc.gc.ca/
12. JAMAEvidence. URL: http://www.jamaevidence.com/
13. Medscape. URL: http://www.medscape.com/
14. National Institute for Clinical Excellence. URL: http://www.nice.org.uk/

15. PRODIGY (Clinical Guidance). URL: http://prodigy.clarity.co.uk/

Practical lesson No. 3

SUBJECT: "Scientific research and its stages. General requirements for research work" - 2 hours

Goal:acquaintance with information publications that contain operational data of scientific research, the most essential aspects of their content.

Basic concepts:

Term	Definition
Scientific research work	is a clearly organized complex of actions aimed at obtaining new knowledge that reveals the essence of the process and phenomena in nature and in society with the aim of using them in practical activities.
A scientific problem	is a form of scientific thinking, the content of which is something that has not been researched by a person, but requires knowledge, that is, it is a question that arose in the process of knowledge or practical activity, and requires an appropriate scientific and practical solution.
Research topic	is a scientific task that covers a certain part of scientific research. This is a task that is formed on the basis of a significant number of questions being studied.
Scientific questions	are more specific tasks of scientific research.

Actuality of theme

Work planning implies the need to choose a research methodology, calculate the volume of observations or the number of experiments, determine how much time is needed to complete the work.

Primary and secondary information is of particular importance for writing a dissertation, as it serves as a theoretical and experimental basis for achieving the goal of the research and solving its tasks. It is proof of the validity of the scientific provisions of the dissertation, their reliability and novelty.

Plan

I. Organizational moment (greetings, checking those present, announcing the topic, the purpose of the lesson, motivating students to study the topic).

II. Control of basic knowledge: Theoretical questions for the lesson:

III. Formation of professional skills and abilities. Practical works (tasks) performed in class:

- Development of a research program;
- Designing the research results;
- The main stages of scientific research;
- Methods of searching and collecting scientific information;
- Types of scientific and technical information.

Topic content:

1. **The main stages of scientific research**.

Research work is a clearly organized complex of actions aimed at obtaining new knowledge that reveals the essence of the process and phenomena in nature and in society with the aim of using them in practical activities.

Scientific research of any class or type is organized in a certain sequence according to a scheme that can be presented in the following form:

- justification of the relevance of the topic;
- studying the state of the object and the subject of research;
- studying the goals and specific tasks of research;
- choice of research methodology;
- description of the research process;
- discussion of results;
- formation of conclusions about research results, their evaluation and implementation in production.

Whatever the specifics of a particular study, the implementation of the above directions always goes through certain stages. As a rule, four main research stages are distinguished.

Characteristics of the main stages of the research

Stages of research	**Content of the research stage**	**Results of the research stage**
1. Programmer	Development of issues of methodology, research methods and techniques	Research program
2. Informational	Use of methods and techniques to obtain an array of reliable and representative information	Empirical information (base)
3. Analytical	Analysis of information, its generalization, theorization, description and explanation of facts, substantiation of trends and regularities, selection of cause-and-effect relationships	Description and explanation of the object (phenomenon or process) being studied
4. Practical-he	Development of practical recommendations and researched technologies	A model of the practical transformation of the object (phenomenon or process) under study

Any research begins with the development of its program, which is considered in two aspects. On the one hand, the program is the main document of scientific research, by which one can judge the degree of scientific validity of a particular study, and on the other hand, it is a defined methodological model of the study, which records the methodological principles, goals and objectives of the study, as well as ways of achieving them .

That is, at the first stage of the research, the current state of the problem is comprehensively analyzed, the justification of the topic is studied and developed.
Based on the analysis of the state of the problem, relevance, novelty of the topic, the object, subject, purpose and main tasks of the research are determined.

Next, a plan for scientific research of the topic, research methods and a work plan is drawn up. A bibliographic list of domestic and foreign literature, scientific and technical reports of research institutes, abstract collections, etc. is compiled.

From the research methods, choose the methods that are most appropriate to use when researching a specific topic.
Therefore, the program plays a central role in the research. Inattention to the construction of a scientifically correct and complete program significantly affects the quality of the research, significantly narrows the researcher's cognitive capabilities, and also reduces the relevance and social significance of the research and its results.

In the second and third stages of the research, the efforts to fulfill the specific tasks developed in the first stage are concentrated. Theoretical or experimental studies are conducted to obtain information about an object, phenomenon or process, which is analyzed and grouped for further transformation in accordance with the needs of the study.

The stage of conducting research using theoretical and empirical methods begins with proving a working hypothesis, formulating conclusions and recommendations, setting up an experiment, and adjusting preliminary conclusions and results.

After the end of theoretical and experimental studies, a general analysis is carried out. The basis of the general analysis of theoretical and experimental research is the comparison of the working hypothesis with the data obtained in the research process.

As a result of theoretical and experimental analysis, the following situations may arise:

- complete or fairly complete coincidence of the hypothesis, theoretical prerequisites with the results of the experiment has been established. At the same time, the obtained material is additionally grouped in such a way that it is clear what the main propositions of the previously developed hypothesis derive

from, as a result of which it turns into a proven theoretical proposition, a theory;

- experimental data only partially confirm the position of the hypothesis, and in the other part contradict it. In this case, the hypothesis is changed and reworked so that it corresponds to the results of the experiment. Further, additional corrective experiments are carried out in order to confirm the working hypothesis and turn it into a theory;
- the hypothesis is not confirmed by the experiment, then it is critically analyzed and completely revised, then new experimental studies are conducted taking into account the new working hypothesis. The results, which are not confirmed, are not rejected, they can contribute to the formation of the correct idea about the object, phenomena and processes.

After the analysis and evaluation of the economic efficiency of the research work (R&D), the fourth stage of the research is carried out - conclusions and recommendations are formed.

At the final stage of scientific research, conclusions are formed, which contain the new and essential things that make up the scientific and practical results of the research. Scientific results are knowledge that meets the requirements of novelty, reliability and practical value.

The final form of implementation of the results of research work is the introduction of its results into production.

2. Development of a research program.

Creating a program begins with identifying a problem situation and choosing a research topic.

The process of any research (cognition) begins with posing a problem as a starting point for directed scientific activity. A problem is understood as a complex scientific task, which covers a significant area of research and has promising significance. Solving problems poses a common task - to make a discovery; to solve a set of tasks that would ensure the development of the national economy.

The level of scientific research is mostly determined by how new and relevant the problems the researcher is working on are. The choice and formulation of such problems are determined by objective and subjective conditions. Solving the problem always involves going beyond the known and therefore cannot be found with the help of previously known rules and methods, which, however, does not exclude the possibility and expediency of research planning.

A scientific problem is often characterized as "conscious ignorance". Indeed, the scientific problem arises with the understanding that the available knowledge is incomplete, and this situation can be corrected only as a result of the further development of science and practice.

So, a scientific problem is a form of scientific thinking, the content of which is something that has not been researched by a person, but requires knowledge, that is, it is a question that arose in the process of knowledge or practical activity, and requires an appropriate scientific and practical solution. This is not a frozen form, but a process that includes two main stages: setting a problem and solving it. The ability to pose a problem correctly is a necessary prerequisite for its successful solution. "The formulation of a problem," noted A. Einstein, "is often more important than its solution, which can only be a matter of mathematical or experimental art. Asking new questions, developing new possibilities, considering old problems from a new angle require creative imagination and reproduce real success in science".

To pose a scientific problem means:

- distinguish between the known and the unknown, facts that are explained, that need explanation, facts that correspond to the theory and that contradict it;
- formulate a question that expresses the main content of the problem, justify its correctness and importance for science and practice;
- determine specific tasks, the sequence of their solution, the methods that will be applied.

To formulate a problem, it is necessary not only to assess its significance for the development of science and practice, but also to have methods and means of solving it.

In essence, the choice of the problem, if not completely, then mostly determines both the research strategy and the direction of scientific research. It is not by chance that it is believed that formulating a scientific problem means showing the ability to distinguish the main from the minor, to discover what is already known and unknown to science on the subject of research.

To solve a scientific problem, it is required to clarify its relevance (importance), justify the possibility of its expansion at the existing level of knowledge in this field, and also establish the expected efficiency (useful) according to the accepted criterion (most often economic).

Therefore, the choice of the research problem is justified primarily by its implementation, relevance, i.e. how far the selected research will contribute development of the implementation of programs of economic and social development of the country.

The problem must be clearly defined, consistent and not contradict economic laws, which helps to use it as a truth for further knowledge of reality.

After substantiating the problem, its structures determine the topic of scientific research, which should be relevant, have scientific novelty, that is, make a certain contribution to science, be economically effective for the national economy, therefore the choice of topic should be based on special technical and economic calculations.

Topicis a scientific task that covers a certain part of scientific research. This is a task that is formed on the basis of a significant number of questions being studied.

Scientific questions are more specific tasks of scientific research. The results of these tasks have not only theoretical, but mainly practical significance, as it is possible to determine the expected economic effect.

When developing a topic or question, specific research tasks are set - to develop the organizational structure of the enterprise, advanced technology, study the sales market, etc.

The topic is formed on the basis of a general familiarization with the problem within which the research will be conducted.

When choosing a topic, the main criteria should be its relevance, novelty and perspective.

When formulating the relevance of the topic, it should be indicated to which sphere of activity or field of knowledge it belongs, what determines its choice, as well as why and where in practice the proposed research is needed. It is necessary to highlight the main thing in a few sentences: the essence of the problem, from which the relevance of the topic follows.

The topic must solve a scientific task, this means that the topic in such a definition has not yet been developed, that is, duplication is excluded. The novelty of the development must be scientific, not technical, that is, fundamentally new. Everything that is already known cannot be the subject of scientific research. The topic should be economically effective and significant. Any topic of applied research should ensure obtaining an economic effect for the national economy. This is one of the important requirements.

When developing theoretical studies, the requirement of economy can be replaced by the requirement of significance. Significance, as the main criterion of the topic, takes place when conducting research that determines the prestige of domestic science, or is the foundation for applied sciences, or is aimed at improving social and industrial relations.

An important characteristic of the topic is its practical application, if this cannot be done, then the development of the topic is ineffective.

Thus, substantiating the scientific problem, choosing and formulating the research topic is the initial stage of any research.

Regarding the master's thesis, its relevance and practical orientation are important. Since the master's thesis is a scientific-research qualification work, how the author knows how to choose a topic and how correctly he understands and evaluates it from the point of view of timeliness and social significance characterizes his professional preparation.

Further, based on the analysis of the problem, the object and subject of the

research are determined.

Objectresearch is what the process of cognition is aimed at (where, among whom is it conducted?). The object can be an institution, a team, a process or a phenomenon studied separately or as part of certain groups of institutions, teams, taking into account positive and negative factors that affect its functioning and cause a problematic situation. That is, the object of research is this or that phenomenon or process, the field of validity of those or any industry relations, which contain the previously formulated contradiction and give rise to a problematic situation to which the process of cognition is directed.

The research object is characterized quantitatively, structurally, as well as from the point of view of spatial and temporal limitations.

The program should clearly record such characteristics of the research objects as:

- spatial (enterprise, district, region, region);
- temporary (the period of the beginning and end of the study);
- industry (the type of activity being investigated, for example, marketing, business);
- socio-demographic (gender, age, education, marital status, etc.).

The subject of researchthere are those properties and aspects of the object that most vividly reflect the contradictions hidden in it, the problem under investigation. These can be certain types or characteristics of people's activities, needs, interests, aggregates of enterprises. The subject reflects the relationship between the problem and the object of research. The subject is a certain field of activity of the object to which the researcher's attention is directed. The subject of research answers the question: "What is being studied?" what are the social connections, relations, aspects?".

So, an object is something that contains certain contradictions, and a subject is its properties and aspects that reflect this contradiction.

*Object and subject*studies can coincide if the researcher sets himself the task of studying the entire set of laws of functioning and development of the object. If the research is limited to the study of individual characteristics of the object, then the subject becomes those aspects of it that contain these characteristics.

The object and the subject of research as a category of the scientific process are related to each other as general and partial. In the object, its part, which is the subject of research, which, as a rule, determines the topic of the master's thesis, is also highlighted.

The next structural element of the program is the definition of the goal and specific research tasks that must be solved in accordance with this goal.

The aim of the studyis the expected final result, which determines the general orientation and logic of the research, i.e. the identification of what this research

should be conducted for. The purpose is determined by the answer to the question: "What is the research for?".

Objectives of the study- is a set of specific target settings that are aimed at analyzing and solving the problem. They reveal the content of the research subject, determine the means of achieving the goal and must be consistent with the hypotheses.

Research tasks can be basic and non-basic. The main ones are determined by the purpose of the research and determine the search for an answer to its central question: what are the ways and means of solving this problem? However, a situation may arise when putting forward additional hypotheses requires solving other issues. Accordingly, additional tasks appear that help to more fully solve the researched goal.

So, tasks formulate questions to which an answer must be received, and thanks to this, the purpose of the research will be realized. If the goal is applied, then the tasks are practical in nature. In research focused on solving theoretical problems, theoretical tasks are the main ones, and practical tasks are not the main ones. In applied research, on the contrary, practical tasks are the main ones, and theoretical ones are not the main ones.

The research task formulates questions that should be answered in order to realize the research goal. They reveal the content of the research subject and agree with the hypotheses. This is usually done in the form of enumeration (study, describe, analyze, establish, discover, find out, define, propose, develop, obtain, etc.). The formulation of these tasks must be done as realistically as possible, since the description of their solution will be the content of the sections of the master's thesis; it is also important because their names correspond to the formulated research objectives.

Hypotheses are an important element of the research program - these are scientifically based assumptions put forward for a possible explanation of certain facts, phenomena, processes that need to be confirmed or refuted. This is a kind of forecast of the expected solution to the research task. It is based on existing theoretical knowledge about the researched object. The ability to test hypotheses is a necessary characteristic of them.

Hypotheses are the starting points of empirical research, its further stages are directly dependent on the proposed hypotheses. They contribute to the efficiency of studying the subject, suggest the choice of methods of gathering information. In the absence of hypotheses, the level of research drops sharply, and its results and generalizations are reduced to the description of percentage expressions of certain indicators and rather trivial recommendations. Therefore, as a general rule, it is better to have bad hypotheses than to have none.

Various types of hypotheses are used in research. Let's name the main ones:

- **basic hypotheses**indicate the most essential connections of the object;
- **hypotheses-consequences**are derived from the main ones and serve as a means of proving them;
- **working hypotheses**are put forward at the initial stages of the analysis and are initial data regarding the nature and properties of the object's relationships under investigation;
- **descriptive hypotheses** -predictions about the actual state of the object, its structure, functions;
- **explanatory hypotheses**focused on the determination of cause-and-effect relationships, identification of causes, facts established thanks to the confirmation of the main hypotheses.

Scientific hypotheses can be formulated only as a result of a preliminary analysis of the researched object, reference to available scientific data. This is what distinguishes a simple assumption from a scientific hypothesis.

Very important for scientific work is the choice of research methods - the tools used to obtain actual material, which is a necessary condition for achieving the goal set in the work. Therefore, in the course of compiling the program, specific methods of data collection, processing and analysis are developed, the reliability of empirical information, scientific interpretation of facts is tested. In its absence, research resembles a search by trial and error, which in some cases does not give a cognitive effect.

The choice of methods of collecting primary information is determined, as a rule, by the purpose of the research, the specificity of its object and subject, the objectivity of hypothesis confirmation, etc. To choose a method means to choose one or another optimal way of obtaining new information for the performance of the assigned task.

The choice of one or another method also depends on a number of other circumstances: the degree of development of the problem being studied in the scientific literature, the capabilities of the researcher or research group, the goals and objectives of the research. In most studies, not one, but several methods of information collection are used, which increases the reliability and reliability of the data obtained.

Along with the above, the program also contains a logical scheme for processing primary information, which involves, first of all, the processing, analysis and interpretation of the received data, as well as the formulation of relevant conclusions on this basis and the development of practical recommendations.

Next, a clear working plan of the study is drawn up. According to his purpose, he is called to organize the main stages of the research according to the program and calendar terms.

3. Types of scientific and technical information.

Depending on the accumulation, use, purpose and perception, scientific information is classified into:

technical information— characterizes physical processes in various objects when creating products from initial components;

economic informationis information about the economic development of society and its efficiency;

social information- information about a person, team and society as a whole, as an object of research.

According to the method of recording information, documents are divided into:

- written (archive materials, press, directories, fiction, personal documents - that is, those in which information is presented in the form of written text);
- statistical (refers to those documents in which the form of information submission is mainly digital);
- iconographic (all pictorial documents, both static - sculptures, houses, ornaments, paintings, photographs, and dynamic - film, television, video materials);
- phonetic (language materials, conversations, songs, fairy tales, etc. in their voiced form - records, tape recordings);
- documents that transmit information in coded form using electronic technology.

The form of the document largely determines the method of its analysis.

Depending on the status of the source, documents are distinguished: official and unofficial.

In addition, documents are divided into:

primary- which contain the results of scientific research and development, new scientific data, ideas, facts. Primary information is formed on the basis of these documents;

secondary— where there are analytical-synthetic and logical materials that have already been processed on the basis of primary documents.

This division is conditional. Important sources of primary information are books, monographs, brochures, manuals and periodicals.

The book is a fairly voluminous non-periodical publication, which concentrates the knowledge and experience accumulated by mankind in a certain field of science.

A brochure is a small volume of work with operational information.

Among books and brochures, monographs, which highlight the results of a comprehensive study of a certain problem or topic, occupy an important place.

A special place among the books used in the field of scientific information is occupied by textbooks and manuals — non-periodical publications that contain systematized information of a scientific and applied nature, presented in an accessible

form for both teachers and students.

The most effective source of scientific and technical information are periodicals that come out after a certain period of time, with a constant number of numbers for each year, but do not repeat themselves in terms of content, having the same name. Traditional types of periodicals are magazines and newspapers. Periodicals also include collections of scientific works by scientists of universities and research institutes.

Special types of technical publications include regulatory and technical documentation that regulates the scientific and technical level and quality of products: standards, standard regulations, methodological developments.

4. Methods of searching and collecting scientific information.

Both primary and secondary information is required for scientific research.

Primary information- these are the initial data that are the result of specific experimental studies, the study of practical experience.

Secondary information- is the result of analytical and synthetic processing of primary information.

The stage of collecting and selecting information for scientific research is one of the key ones.

Its organization involves:

- definition of the range of issues to be studied;
- chronological boundaries of the search for the necessary literature;
- clarifying the possibility of using the literature of foreign authors;
- clarification of information sources (books, articles, patent literature, standards, etc.);
- determination of the degree of selection of literature - all on this issue, or only individual materials;
- participation in thematic seminars and conferences;
- personal contacts with specialists on this problem;
- study of archival documents, scientific and technical reports;
- searching for information on the Internet.

Source information can be found in general and special encyclopedias, as well as in the lists of literature that are attached to thematic and review works related to the topic. In this case, the search for information is conducted in antichronological order - from later sources to earlier ones. This way of searching leads to the set goal faster.

When searching for information, certain principles of its formation should be followed, namely:

- the relevance of the information should realistically reflect the state of the research object at each moment of time;
- reliability is proof that the named result is true;

- the information must accurately reproduce the objective state and development of the object;
- informational unity, i.e. presentation of information in such a system of indicators, in which the possibility of contradictions in conclusions and inconsistency of primary and obtained data would be excluded;

- data relevance, that is, obtaining information at the user's request, including working with data that does not belong to the study.

Adherence to these principles would make it possible to exclude the duplication of scientific research. According to the estimates of American specialists, from 10 to 20% of research works could not be carried out if the scientific information on the problem being studied was correctly selected.

Finding the right information is becoming more difficult every year. Therefore, all researchers should know the basic provisions of information search.

Information search is a set of operations aimed at finding documents that are needed to develop the topic of the problem.

The search can be:

manual, which is carried out by bibliographic cards, file cabinets, catalogs, mechanical and automated. Determining the state of study of the topic is expedient to begin with familiarization with informational publications that contain operational systematized information about documents, the most essential aspects of their content.

Information publications, unlike bibliographic ones, include not only information about printed works, but also the ideas and facts contained in them. In addition to efficiency, they are characterized by the novelty of the information provided, the completeness of the covered sources and the presence of a reference apparatus, which facilitates the search and systematization of literature.

Information publications cover all branches of the national economy. they are issued by institutes, NTI services, information centers, libraries.

Primary information is important to confirm the validity of research conclusions and results, to test the working hypothesis.

When working with literature, it is necessary to make extracts, annotations and summaries, with the help of which the most valuable information is highlighted, and the content of the information as a whole is concisely presented.

It is necessary to review all types of information sources, the content of which is related to the research topic. These include materials published in various domestic and foreign publications, research reports, dissertations, and official documents.

The most common and meaningful methods of collecting primary information are: survey, observation, experiment, testing, questionnaire.

Document analysis is an effective method of collecting primary information.

Documents with varying degrees of completeness reflect the economic state of the problem, the factual side of social reality; they contain information about the processes and results of the enterprise, individuals, collectives, large population groups and society as a whole. It is from the analysis of documents that a specific study should begin.

After conducting an empirical study, its final stages begin: processing, analysis and generalization of data. The effectiveness of the research depends not only on the volume of the information array, but also on the depth and comprehensiveness of its analysis. By itself, primary information does not make it possible to draw conclusions, test hypotheses and, thus, solve the tasks set in the program. Therefore, mastering techniques and methods of data analysis is the key to effective research.

Materials for self-control:

AND. Questions for self-control:

B. Test tasks and problems

Summing up.

List of recommended literature

Main:

1. Gutorov O.I. Methodology and organization of scientific research: study guide. Kharkiv: KHNAU, 2017. 272 p.
2. Danilyan O.G., Dzoban O.P. Organization and methodology of scientific research: teaching. manual Kharkiv: Pravo, 2017. 448 p.
3. Degtyarev A.V., Kokodiy M.G., Maslov V.O. Fundamentals of scientific research: a study guide. Kharkiv: KHNU named after V. N. Karazina, 2016. 78 p.
4. Kostyukevich V.M., Konnova M.V. Methodology of scientific research: study guide. Vinnitsa. 2017. Vol. 172.
5. Malyhina V.D. Methodology of scientific research. Rivne. 2016. 247 p.
6. Methodology of scientific research: teaching manual. / V.I. Zatserkovnyi, I.V. Tishaev, V.K. Demidov – Nizhyn: NSU named after M. Gogol, 2017. – 236 p.
7. Methodology of scientific research in medicine: teaching. manual / V.D. Babajan, N.S. Bakumenko, O.I. Kadykova and others; under the editorship P.G. Kravchuna, V.D. Babajana, V.V. Meat eater. – Kharkiv: KhNMU, 2020. – 260 p.

Additional:

1. Puzanova O. G. Information provision of evidence-based health care. Part I. / O. G. Puzanova, T. S. Gruzheva // Proof. honey. – 2014. – No. 4 (16). - P. 23-33.
2. Skakun M. P. Fundamentals of evidence-based medicine: monograph / M. P. Skakun. - Ternopil: Ukrmedknyga, 2005. - 244 p.
3. Chernobrovy V. M. Health, pre-disease, disease: medical and social aspects and assessment. Risk factors. Preventive medicine: a guide for graduate students,

interns, general practitioners - family medicine / V. M. Chernobrovyi, S. G. Melashchenko, T. M. Tkachuk. – Vinnytsia: Planer, 2013. – 80 p.

4. Shulyak V. I. International experience of using an integrated clinical protocol in medical practice (literature review) / V. I. Shulyak // Ukr. honey. magazine – 2010. – No. 5 (79). - P. 41-44.

5. Howick J. The Philosophy of Evidence-Based Medicine / J. Howick. - Oxford: Blackwell-Wiley, 2011. - 238p.

Electronic information resources:

1. Best Evidence. URL: http://www.bestevidence.com/

2. BritishMedicalJournal. url http://www.bmj.com/specialties/evidence-based-practice

3. CanadianMedicalAssociation. URL: http://www.cma.ca/

4. Center for Evidence-based Medicine at the University of Oxford. URL: http://www.cebm.net/

5. Clinical Evidence. URL: http://clinicalevidence.bmj.com/x/index.html

6. Cochrane Collaboration open learning material for reviewers. URL: http://www.cochrane-net.org/openlearning

7. Cochrane Library. URL: http://www.thecochranelibrary.com/

8. Current Controlled Trials. URL: http://www.controlled-trials.com/mrct

9. eGuidelines. URL: http://www.eguidelines.co.uk/

10. Evidence-Based Medicine. URL: http://ebm.bmj.com/

11. Canada Clinical Guidelines Database. URL: http://www.phac-aspc.gc.ca/

12. JAMAEvidence. URL: http://www.jamaevidence.com/

13. Medscape. URL: http://www.medscape.com/

14. National Institute for Clinical Excellence. URL: http://www.nice.org.uk/

15. PRODIGY (Clinical Guidance). URL: http://prodigy.clarity.co.uk/

Practical lesson No. 4

SUBJECT: "Methodology of scientific research" - 2 hours

Goal:familiarization with the order of organization of scientific and research activities

- consider approaches to the classification of objects of scientific research and scientific research itself;
- reveal the stages of scientific research;
- to familiarize with the organization of scientific activity in Ukraine;
- consider the concepts of researcher, scientist, scientist, scientific worker, scientific school;
- to disclose the procedure for training and certification of scientific and scientific-pedagogical personnel;
- to acquaint students with scientific research activities in the organization.

Basic concepts:

Term	Definition
Scientist	— a natural person (a citizen of Ukraine, a foreigner or a stateless person) who has a full higher education and conducts fundamental and (or) applied scientific research and obtains scientific and (or) scientific and technical results.
Scientific (research) activity	—— intellectual creative activity aimed at acquiring and using new knowledge.
Scientific topic	— a part of a scientific problem that covers one or more research questions.
A scientific problem	- a number of complex theoretical and practical problems, the solution of which is overdue in society.
Scientific research	- is a purposeful process of cognition, which is carried out with the aim of exposing the patterns of changes in objects depending on certain conditions of place and time of their functioning for their further use in practical activities.
A scientific question	- a small scientific task related to a specific topic of scientific research.
Scientific direction	- a science or a complex of sciences in which research is conducted.
Scientific worker	- a scientist who is professionally engaged in scientific, scientific-technical, scientific-organizational or scientific-pedagogical activities at his main place of work and in accordance with the employment contract (contract) and has the appropriate qualification, regardless of the presence of a scientific degree or scientific title, confirmed by the results of certification.
Scientific result	- new knowledge acquired in the process of fundamental or applied scientific research and recorded on scientific information carriers.

Scientific and applied result	– a new constructive or technological solution, an experimental sample, a completed test, which is implemented or can be implemented in public practice.. specified formulation of the topic; the status of the issue and justification of the chosen field of work; content, objects and research methods; stages of work with an indication of the content and completion date of each stage (calendar work plan).

Actuality of theme

Work planning implies the need to choose a research methodology, calculate the volume of observations or the number of experiments, determine how much time is needed to complete the work.

Primary and secondary information is of particular importance for writing a dissertation, as it serves as a theoretical and experimental basis for achieving the goal of the research and solving its tasks. It is proof of the validity of the scientific provisions of the dissertation, their reliability and novelty.

Plan

I. Organizational moment (greetings, checking those present, announcing the topic, the purpose of the lesson, motivating students to study the topic).

II. Control of basic knowledge: Theoretical questions for the lesson:

III. Formation of professional skills and abilities. Practical works (tasks) performed in class:

- Stages of scientific research;
- Designing the research results;
- Classification of scientific research.

Topic content:

Law of Ukraine "On scientific and scientific and technical activity"interprets the concept of scientific activity as follows.

Scientific (research) activity- intellectual creative activity aimed at acquiring and using new knowledge.

Adjacent to scientific activities are the following:

1) scientific and technical activity - intellectual creative activity aimed at obtaining and using new knowledge in all fields of engineering and technology;

2) scientific and pedagogical activity - pedagogical activity in higher educational institutions and institutions of postgraduate education of III-IV levels of accreditation, related to scientific or scientific and technical activity;

3) scientific and organizational activity - activity aimed at methodical, organizational support and coordination of scientific, scientific-technical and scientific-pedagogical activities;

4) scientific and information activity - a set of actions aimed at meeting the needs of citizens, legal entities and the state in scientific and technical information,

which consists in its collection, analytical and systematic processing, recording, storage, search and dissemination;

5) research and support activities, etc.

Each of the specified types of scientific activity has its own specific functions, tasks, and work results.

Scientific researchis a purposeful process of cognition, which is carried out with the aim of revealing the patterns of changes in objects depending on certain conditions of place and time of their functioning for their further use in practical activities. This is an organized process of mental work, directly aimed at the production of new knowledge. Obtaining new scientific data is a social need of society, which has increased recently, in the era of research and development.

Each research work can be attributed to a certain scientific direction. A scientific field is a science or a complex of sciences in which research is conducted. In this regard, technical, biological, social, historical and other directions are distinguished with possible further detailing. The basis of the scientific direction is a special science, as well as its inherent research methods and technical means of their implementation.

Structural units of the scientific directionthere are complex scientific problems, scientific problems, scientific topics and scientific questions.

Complex scientific problemis a set of problems united by a single goal.

A scientific problemrepresents a number of complex theoretical and practical tasks, the solution of which is overdue in society. From a social point of view, the problem is a reflection of the contradiction between the social need for knowledge and the known ways of obtaining it, the contradiction between knowledge and ignorance. Depending on the scale of the tasks that arise, global, national, regional, branch and inter-branch problems are distinguished.

Scientific topicis a component of a problem that covers one or more research questions. As a result of carrying out research works on one or another topic, answers to a certain range of scientific questions covering part of the problem are obtained. Summarizing the results of research on a complex of topics can allow solving a scientific problem.

Scientific questions are small scientific tasks related to a specific topic of scientific research.

The specificity of scientific work determines the purpose of scientific research work. The purpose of scientific research is a comprehensive, reliable study of an object, process or phenomenon, their structure, connections and relations based on the principles and methods of knowledge developed in science, as well as obtaining and implementing in practice results that are useful for people. Modern scientific research has certain features that affect the effectiveness of scientific work:

- heredity characterizes the connection between living and embodied scientific work in previously performed research. A scientist creates using the heritage of the past, which allows avoiding parallelism and errors in research work;

- the probable nature of the research results is manifested in the fact that it is aimed at creating new information. In this regard, the results of scientific research can significantly exceed the researcher's expectations, or they can be meager. This feature

of scientific research requires strong-willed and moral qualities (organization, persistence, firmness) from scientific workers;

- the uniqueness of the study is reflected in the limitation of the use of many conditions or typical methods and regulatory materials that facilitate the organization of work in material production (technological maps, production standards, etc.). This requires independence, efficiency, and initiative from the researcher;

- the complexity and complexity of research increase the requirements for scientific workers - for their abilities, professional qualifications and organization - and create additional difficulties in the cooperation of the work of researchers of various profiles. First of all, this refers to the economic aspects of the investigated problem. They require not only the expansion of the economic outlook, but also the use of knowledge of related professions, the involvement of qualified economists;

- the scale and complexity of the research are based on the study of a large number of objects and experimental verification of the obtained results;

- the duration of the research requires the researcher to clearly plan the work both in time and in space;

- the connection between research and practice is due to the need to transform science into a direct productive force. It provides for the constant contact of scientists with practitioners and the cooperation of their work.

Each scientific research has its own object and subject. The concepts of "object" and "subject" of cognition should be distinguished. The object of scientific research is considered to be a fragment of reality to which the cognitive activity of the researcher is directed (material or ideal system). The subject of research is the processes and phenomena within the selected object (structure of the system, patterns of interaction of elements within the system, patterns of development, properties of the system, etc.). The subject always coincides with the research topic.

The classification of research objects means their division into groups based on certain characteristics for the purpose of study and scientific generalization.

The most common are the methods of classifying research objects according to the presence and absence of signs, as well as according to the modification of signs. Dividing objects according to the presence and absence of features allows us to distinguish two of their classes, one of which has a certain property, and the other does not. At the same time, the division can be detailed within each class. The classification of objects according to the variation of features involves the selection of collections of objects, in each of which the feature common to all is manifested in a special way.

It is possible to study both theoretical objects (action of the law of supply and demand) and empirical ones (enterprise profit, quality of trade service).

Empirical objectsare divided into natural (physical), which exist in nature regardless of the will of people, and artificial (technical), which are created as a result of human activity.

Depending on the degree of complexity, simple and complex research objects are distinguished. Simple objects usually consist of several elements, and complex ones have an uncertain structure and require the identification of external and internal influencing factors. At the same time, material, energy and informational factors of

influence are distinguished.

The study of the factors determining the development of the research object allows to characterize its environment. Environment - everything that surrounds the object of research and affects its elements. The results of scientific research are largely determined by the completeness and depth of the study of the impact of the environment on the object of research.

Objects studied in scientific work are considered in the process of their dialectical development, in interconnection and interdependence, since both natural phenomena and technical systems do not exist separately.

A characteristic feature of modern science is a systematic approach to the study of research objects. This means that the latter are not considered in isolation, but as a complex whole, not only the structure and properties of the object are revealed, but also the connections of its parts, subsystems, and their functions, its relationship with the environment is established, that is, the object research is studied as part of a more general system.

Scientific studies are classifiedon different grounds.

Depending on the research methods, used, scientific research can be theoretical, theoretical-experimental and experimental.

Theoretical scientific researchare based on the use of logical and mathematical methods of cognition, their result can be the establishment of dependencies, qualities, connections, etc. in the studied objects. For example, a study of the nature and role of circulation costs in trade.

Theoretical and experimental scientific research- this is research of a theoretical nature, connected with the simultaneous experimental verification of the identified dependencies, qualities, connections, etc. For example, the study of factors affecting the amount and level of circulation costs in trade.

Experimental scientific research- this is research conducted in specific objects with the aim of identifying new dependencies, qualities, connections, or checking previously advanced theoretical propositions. For example, the study of the formation of turnover costs in trade enterprises.

Depending on the field of use of the results scientific research is divided into fundamental, applied and development.

Fundamental scientific research- is a scientific theoretical or experimental activity aimed at obtaining new knowledge about the patterns of development of nature, society, man, and their interrelationships. The need for such research is determined by the needs of the national economy or industry. They may end with recommendations on setting up applied research to determine the possibilities of practical use of the acquired scientific knowledge, scientific publications, etc. For example, research on ways to accelerate NTP in production.

Applied scientific research- is a scientific and scientific-technical activity aimed at obtaining and using knowledge for practical purposes, searching for the most rational ways of practical use of the results of fundamental scientific research in the national economy. Their ultimate consequence is recommendations for the creation of technical innovations (innovations). For example, a study of the effectiveness of the automation of the manager's work.

Fundamental and applied scientific research are the main forms of scientific activity.

Developments- is a purposeful process of transformation of applied scientific research into technical applications. They are aimed at creating new equipment, materials, technologies, etc. The scope of development includes design and technological works, works on the creation of prototypes (batches) of products (products), as well as design works for construction.

By types of connection with social productiondistinguish research works aimed at creating new processes, machines, structures, etc., which are fully used to increase production efficiency; research works aimed at improving industrial relations, raising the level of production organization without creating new means of labor; research works in the field of social, humanitarian and other sciences, used to improve social relations, increase the level of spiritual life of people.

According to the degree of importance for the national economyscientific research is classified into the most important works carried out according to the plans of the National Academy of Sciences of Ukraine; research works carried out according to the plans of branch ministries and departments; research works carried out at the initiative of research organizations.

Depending on the sources of fundingscientific research is divided into state-budget research (financed from the state budget), farm-contract research (financed in accordance with concluded contracts by client organizations), and unfunded research.

By duration of developmentscientific research is divided into long-term, which is developed over several years, and short-term, which is usually carried out in a year.

By research stagesresearch works are differentiated into search, research and research and production developments. When formulating any scientific and technical problem of an applied nature, the researcher's attention is directed, first of all, to the consideration of the results of fundamental research and practical achievements in this or that field. If such information is not available, a search research is performed. Exploratory research is aimed at selecting factors affecting the object, finding ways to create new technologies and techniques based on the methods proposed as a result of fundamental research. For example, the study of the principles of material stimulation of work in trade.

Compared to exploratory research, research and development is more specific in nature and is aimed at creating new technologies, research equipment, devices, and recommendations. For example, recommendations on material stimulation of work in the service sector.

Scientific and industrial development involves bringing the results of scientific and research development to the conditions of practical use and includes experimental verification of recommendations of scientific and research developments, their coordination with the needs of specific organizations and enterprises. For example, recommendations on improving the material stimulation of work in trade.

Research related to bringing scientific and scientific and technical knowledge to the stage of their practical use (research and design, design and construction, technological, search, design and search works, production of experimental samples

or batches of scientific and technical products) are the main forms scientific and technical activity.

Depending on the venuescientific research is divided into laboratory and production. The venue determines the organization of the research, methods, tools, research tools used, as well as the choice of the research object.

According to the composition of the qualities of the objectdistinguish complex and differentiated scientific research. Modern scientific research is mostly complex in nature. Complex works involve the implementation of a number of independent in terms of place and time, as well as methods and means of research of various groups of qualities of a certain object. For example, the study of ways to increase the efficiency of the economic activity of a trading enterprise.

The research of one of the qualities or a group of homogeneous qualities of an object is classified as differentiated. For example, research on ways to increase the efficiency of the use of fixed assets of a trading enterprise.

The classification of scientific research allows us to define the subject of scientific research work of students of the Faculty of Management. He performs applied theoretical-experimental and experimental, complex and differentiated research in the field of management in the aviation (tourism) industry.

Stages of scientific research:

1. Choosing the topic of scientific research is the most difficult and responsible stage.

Scientific topic(from the Greek thema - the main idea, task, position that needs to be developed) is part of a scientific problem that covers one or more research questions.

Research topics are divided into theoretical, methodological and organizational.

*Theoretical topics*involve the study of separate concepts of the theory of a certain science, relating to its scientific laws, the development of axiomatic knowledge.

*Methodological topics*relate to the methods of a certain science used in the process of studying its objects.

*Organizational topics*include the organization of research on a certain science and the application of its results in practical activities.

2. Acquaintance with the problem using literary sources.

A scientific problem(Greek - difficulty, task, obstacle) are considered a set of new, dialectically complex theoretical or practical questions that contradict existing knowledge or applied methods in science and need to be solved with the help of scientific research.

After the preliminary selection of the topic, the researcher needs to conduct a bibliographic search in this field in order to get an accurate idea of what has been done before him on the researched issue.

When choosing the literature, it is recommended to first of all stop at some larger source in which the selected research problem is considered. In the course of a careful study of such a work, it can be found that a number of works are named in the text, sub-references and the list of used literature, in which the problem chosen for research is considered.

The study of scientific publications must be carried out in stages:

- general introduction to the work as a whole according to its content;
- a cursory review of the content;
- reading in the order of the sequence of the location of the material;
- selective reading of any part of the work;
- extract of materials of interest;
- critical assessment of what was recorded, its editing for possible use in one's work.

It is desirable to carry out such work in parallel with the compilation of a card index of literary sources. When analyzing the card file, you can find out that the problem intended for research has already been studied, described and widely used in practice. Thus, a thorough study of the literature will avoid useless work on an already solved problem. The card file can also indicate that although the researched topic has already been widely considered in many works, a number of issues will be touched on only in passing, superficially, not studied in detail.

3. Clarification of the problem (topic) and compilation of the content of the research work.

When compiling the content of the work, first of all, it is necessary to justify the topic, determine its relevance, novelty, object and subject, set a goal, develop a task, choose research methods, etc.

Object of studyacts as a general field of search, and the subject is the concrete thing that turns out to be. The same object can be studied in different aspects. Therefore, the definition of the subject can be understood as the definition of a certain aspect of the research, as an assumption about the most essential characteristic of the object under investigation.

An important requirement is the correspondence of the subject to the object of research. A subject is a narrower concept than an object, it is a part, side, element of an object. If the object is the learning process, then the subject can be methods, forms, content, conditions, etc.

Its purpose and tasks follow from the subject of research.

The aim of the study- the expected final result, which determines the general direction of the research. The purpose of the research is revealed in its tasks. Problems are questions that must be answered in order to realize the purpose of the study. In other words, tasks are ways to achieve a goal.

*The first task*related to the identification, clarification, methodological substantiation of the nature and structure of the object being studied.

*The second task*related to the analysis of the real state of the subject of research, dynamics, internal contradictions, etc.

*The third task*related to the modeling of the problem, its research and experimental verification.

*The fourth task*related to the identification of ways and means of increasing the efficiency of the investigated phenomenon or process, that is, with practical aspects of the work, with the proposal of some measures to improve the state of the investigated problem.

It is desirable that the answer to the tasks should be the content of the relevant

sections of the work.

4. Formulation of the research hypothesis.

Hypothesis(from the Greek - prediction of solution) - guiding scientific idea that needs further verification from the point of view of qualitative characteristics. A hypothesis is a scientifically based assumption about a fact that is beyond direct observation or about regular connections and a regular order of phenomena that have not been tested by scientific methods. The following types of hypotheses are distinguished: unfounded, theoretically justified, empirically justified and fully justified.

The hypothesis must be one that is tested; have a certain foresight; should not be logically contradictory.

The need to develop a hypothesis is that, firstly, it is impossible to carry out research without having a certain goal (idea) and methods of achieving it; secondly, predicting the solution (hypothesis) gives an idea of the adequacy of the material available to the researcher, or its insufficiency. Knowledge of the research methodology directs the researcher to the necessary array of information that needs to be collected in the research process.

5. Conducting theoretical and empirical research.

In scientific research work, observation methods in its various forms, analysis and generalization of own practical experience and the experience of other employees are used mainly, a scientific experiment is conducted, analysis of the results of the work of enterprises, institutions, various special research methods, as well as methods of mathematical statistics, modeling, etc. .

6. Systematization of accumulated material in accordance with the work plan, analysis of scientific works, practical experience, generalization, etc.

7. Theoretical treatment of results.

At this stage, the materials collected during experimental research are processed statistically. On the basis of the received materials about the individual phenomena being studied, the data characterizing the studied complex as a whole is determined.

Summarizing the results of the study should not be confused with summarizing, that is, summarizing the data accumulated during the study. After summarizing the results of the research, it may turn out that the obtained data are not reliable enough, there is a need for additional collection of materials. An additional series of observations and experiments is conducted. At the same time, it should be borne in mind that additional observations and experiments should be carried out under the same conditions as the main ones. The summarized results of the study are subject to study and analysis. The main task of analyzing the obtained data is to compare them with the formulated hypothesis and clarify it.

8. Compilation of an extended plan of research work, in accordance with the content of the developed material.

9. Literary presentation of research results.

All research materials are systematized and prepared for generalization and literary design, general conclusions for research work are formulated. When preparing the work, you should be guided by the requirements of the HAC.

10. Implementation of research results in practice.

Scientific result- new knowledge acquired in the process of fundamental or applied scientific research and recorded on scientific information carriers in the form of a scientific report, scientific work, scientific report, scientific report on scientific research work, monographic study, scientific discovery, etc.

Scientific and applied result– a new constructive or technological solution, an experimental sample, a completed test, which is implemented or can be implemented in public practice. A scientific and applied result can be in the form of a report, sketch project, design or technological documentation for scientific and technical products, full-scale sample, etc.

The main results of scientific research include:

- scientific abstracts;
- scientific reports (messages) at conferences, meetings, seminars, symposiums;
- course (diploma, master's) theses;
- reports on research (research and design; research and technology) work;
- scientific translations;
- theses (candidate or doctoral);
- dissertation abstracts;
- deposited manuscripts;
- monographs;
- scientific articles;
- analytical reviews;
- copyright certificates, patents;
- algorithms and programs;
- reports on scientific conferences;
- preprints;
- textbooks, training aids;
- bibliographic indexes, etc.

11. Evaluation of research results.

If the main characteristic of fundamental research is its theoretical relevance, novelty, conceptuality, provenance, perspective, and the possibility of implementing the results into practice, then when considering applied research, one should first evaluate their practical relevance and significance, the possibility of implementing the results into practice, and the effectiveness of the results. For scientific developments, novelty, relevance and efficiency are valuable here.

Economic efficiencyit is characterized by the indicators of the economy of living and physical labor in social production, the sphere of services expressed in value dimensions, which are obtained from the use of the results of the NDD and their comparison with the costs of conducting the study.

Scientific and technical efficiencycharacterizes the growth of new scientific knowledge intended for the further development of science and technology.

Social efficiencymanifests itself in the improvement of people's living standards, the development of health care, culture, science and education, the improvement of environmental conditions, etc.

The mentioned types of effectiveness of research works are interconnected and influence each other.

The state provides priority support for the development of science as a determining source of economic growth and an integral component of national culture and education, creates the necessary conditions for realizing the intellectual potential of citizens in the field of scientific and technical activity, ensures the use of achievements of domestic and world science and technology to solve social, economic , cultural and other problems.

The Verkhovna Rada of Ukraine forms the state science and technology policy based on the annual report of the Government of Ukraine. Verkhovna Rada of Ukraine:

- determines the main goals, directions, principles of the state scientific and technical policy and the legal basis of activity in the scientific and technical sphere;
- establishes the amounts of budget funding of scientific research, budget deductions to the State Fund for Fundamental Research, the State Innovation Fund, and the size of the state reserve of material, technical and raw materials to support scientific and technical activities;
- approves the priority areas of science and technology development, the list of national scientific and technical programs and the amount of funding for each of them for the entire period of implementation with annual clarification in the budget;
- creates a system of credit and financial, tax and customs regulators in the scientific and technical sphere.

The general management of scientific research is carried out by the Cabinet of Ministers of Ukraine, which considers and approves the main directions of the development of science and scientific research at the Verkhovna Rada; organizes the development of national and state scientific and technical programs; determines the order of their financing; coordinates measures to create a modern infrastructure of scientific and technical activity.

Science management is entrusted to the Ministry of Education and Science, Youth and Sports of Ukraine. The Ministry of Education and Science, Youth and Sports of Ukraine determines the main measures to increase the effectiveness of scientific research and the implementation of their results in the national economy, provides scientific and technical information, coordinates the development of interdisciplinary problems, organizes scientific and technical cooperation with foreign scientific and research institutions. When solving scientific issues, the Ministry relies on the opinion of the scientific community. For this purpose, scientific councils are created, which perform the role of scientific and advisory bodies.

The decree of the President of Ukraine dated December 9, 2010 No. 1085 established a central body of executive power - the State Agency for Science, Innovation and Informatization. The activities of this agency are directed and coordinatedCabinet of Ministers of UkrainebyMinister of Education and Science, Youth and Sports of Ukraine. The main tasks of the State Information Science of Ukraine are:

- implementation of state policy in the field of scientific, scientific and technical, innovative activities, informatization, formation, use and protection of state electronic information resources and creation of conditions for the development of the information society;

- submission of proposals for the formation of state policy in the specified areas for the consideration of the Minister.

In Ukraine, science is organizationally divided into five interrelated spheres (sectors):

1. The first sector includes academic science, which includes institutions of the National Academy of Sciences of Ukraine, the Ukrainian Academy of Agrarian Sciences, the Academies of Medical, Pedagogical and Legal Sciences of Ukraine, as well as branch academies: the Ukrainian Academy of Environmental Sciences, the Ukrainian Academy of Architecture, the Academy of Engineering Sciences of Ukraine, Academy of Sciences of the Higher School of Ukraine, Ukrainian Academy of Economic Cybernetics, International Academy of Computer Sciences and Systems, International Academy of Bioenergy Technologies.

The leading place in scientific research is occupied by the National Academy of Sciences of Ukraine (NANU). NASU leads and coordinates fundamental research in various fields of science. It includes research institutes, laboratories, museums, an astronomical observatory, botanical and acclimatization gardens, a biological station, a printing house and a library. The Academy of Sciences of Ukraine was founded in November 1918. According to the charter, it was supposed to develop more than 60 scientific directions in three departments. The first department is the history of the Ukrainian people, writing, art, history of the Ukrainian church, general linguistics, language and literature, Slavic history, history of world literature, philosophy, etc. The second department combined mathematics, mechanics, astronomy, physics, chemistry, geology, botany, zoology, geography and others. It was called physico-mathematical. The third department combined two sub-departments: legal sciences (philosophy of law, Slavic legislation, state, administrative and international law, church law, criminology, civil law, etc.) and economic sciences (theoretical economics, sociology, industrial economics, rural economy, business economics, accounting, auditing, statistics, finance, credit, banks and money circulation, demography, etc.).

Currently, the list of science branches has expanded and changed significantly, and the National Academy of Sciences organizationally includes five scientific centers: Southern, Donetsk, Dnipro, Western, and North-Eastern. Each center has departments that correspond to the main fields of research in a certain region. Thus, the Dnipro Scientific Center develops problems of ecology; Western - the concept of implementing land reform, creating a computerized information bank of land resources; Donetsk comprehensive program of economic and social development of Donbass; Southern problems of rational water use, ecological and economic justification of the construction of the second stage of the Danube-Dniester irrigated hemes; North-Eastern - carries out a significant amount of expert work on the technical rearmament of enterprises, etc. Each scientific center has research institutes or their departments.

2. Branch science is the second field of science organization in Ukraine. It includes independent scientific organizations subordinate to state and branch management bodies (ministries and departments) and independent research institutes, design bureaus, scientific and industrial associations. Branch research institutions work for a certain branch and are closest to the problems of its development. They are subordinate to the following ministries: the Ministry of Energy and Coal Industry, the Ministry of Health, the Ministry of Infrastructure, the Ministry of Agrarian Policy and Food, other ministries and agencies.

3. University science (the third sector) is represented by higher educational institutions that have special divisions (problem and branch laboratories, research units, etc.), and also that perform scientific and technical work in departments.

4. Factory science (fourth sector) includes both independent research units that are part of production associations, as well as design, technological and other technical services, units in the structure of enterprises that are not legal entities.

5. Non-agency science (entrepreneurial sector) unites non-state scientific organizations created recently, as a rule, in the form of small enterprises of various organizational and legal forms. This field includes powerful scientific organizations created by commercial structures, including those involving foreign capital. This should also include small innovative (venture) enterprises, private consulting centers. The development of organizational forms in the field of applied (industry) science in modern conditions gave birth to new organizational structures - incubators, technoparks, technopolises.

Incubatorspecializes in creating favorable conditions for starting and conducting effective activities of small innovative (venture) firms engaged in the implementation of original scientific and technical ideas. This is achieved by providing small innovative firms with material (first of all, scientific equipment and premises), informational, consulting and other necessary services.

Technopark- this is a compactly located complex that can include scientific institutions, higher educational institutions and industrial enterprises.

Technopolissimilar to a technology park, has the form of a small town (population), in which scientific and scientific and industrial complexes are located. It is a kind of conglomerate of hundreds of research institutions, industrial firms (mostly small), implementing organizations located in the same territory, which are united by an interest in the emergence of new ideas and their commercialization as soon as possible. The amalgamation of small firms creates an infrastructure sufficient for major innovations. The main link of the technopolis is mainly a large university - a generator of fundamental knowledge that is the basis of innovation. Technoparks as organizational forms of scientific and technical activity were created in the USA and Western European countries. In Japan, 19 technopolises have been formed, which have accumulated a powerful potential for the development of advanced technologies in priority areas of science. Ukraine has begun to introduce these progressive and effective forms of scientific activity.

5. Conclusions on the lecture.

The Law of Ukraine "On Scientific and Scientific-Technical Activity" defines the concept of scientific activity as an intellectual creative activity aimed at obtaining

and using new knowledge. Its main form is scientific research - a purposeful process of cognition, which is carried out with the aim of exposing the patterns of changes in objects depending on certain conditions of place and time of their functioning for their further use in practical activities.

Each research work can be attributed to a certain scientific direction. The structural units of the scientific direction are complex scientific problems, scientific problems, scientific topics and scientific questions.

*The object of scientific research*consider what the researcher's cognitive activity is aimed at; it can be a material or an ideal system. The subject of knowledge is the structure of the system studied for a specific purpose, patterns of interaction of elements inside and outside the system, patterns of development, properties of the system, etc.

*Scientific studies are classified*by research methods, by the field of use of the result, by the types of connection with social production, by the degree of importance for the national economy, by sources of financing, by the duration of development, by the stages of the research, by the location and by the composition of the qualities of the object of research.

Conducting scientific research can be conditionally divided into 11 stages. Indicators of economic, scientific-technical and social efficiency are used to evaluate the results of scientific research.

*Verkhovna Rada of Ukraine*forms the state scientific and technical policy. The general management of scientific research is carried out by the Cabinet of Ministers of Ukraine. Science management is entrusted to the Ministry of Education and Science, Youth and Sports of Ukraine. Implementation of state policy in the field of scientific and scientific and technical activities is entrusted to the State Agency for Science, Innovation and Informatization.

In Ukraine, science is organizationally divided into five interrelated spheres (sectors): academic, industry, university, factory and non-agency science.

6. Tasks for independent preparation on the topic.

A list of questions for self-study on the topic.

1. Concept of researcher, scientist, scientist, scientific worker, scientific school.
2. Training of scientific and scientific-pedagogical personnel.
3. Procedure for attestation of highly qualified scientific personnel.
4. Concepts, tasks, content and directions of scientific research activities of students.
5. Scientific research workstudents within the educational process and outside it.

7. Summary of questions for independent study on the topic.

A large number of people are engaged in scientific and research activities. Those who do this constantly are called researchers, scientists (researchers), scientists.

A researcherthey call a person who leadsresearch, engagedscientific research,study,observation,analysisanything, contributes to obtaining new onesof

knowledge.

Scientist- an expert in at least one fieldscience, which is in their ownresearchapplies exclusivelyscientific methods(the synonym of this word is more often used - scientist).

The Law of Ukraine "On Scientific and Scientific-Technical Activities"the concepts of scientist and scientific worker are defined.

Scientist- a natural person (a citizen of Ukraine, a foreigner or a stateless person) who has a full higher education and conducts fundamental and (or) applied scientific research and obtains scientific and (or) scientific and technical results.

Scientific worker- a scientist who is professionally engaged in scientific, scientific-technical, scientific-organizational or scientific-pedagogical activities at his main place of work and in accordance with the employment contract (contract) and has the appropriate qualification, regardless of the presence of a scientific degree or scientific title, confirmed by the results of certification.

People of science have appropriate specialties and qualifications, work both independently and by joining scientific teams (permanent or temporary), create scientific schools.

Scientific school(NS) is an informal creative team of researchers of different generations, united by a common program and style of research work, acting under the leadership of a recognized leader. This association of like-minded people, which develops vital problems for society under the leadership of a well-known researcher in a certain field, has significant theoretical and practical results of its activity, recognized in scientific circles and the field of production.

The following main functions are implemented in the activities of the scientific school:

• production of scientific knowledge (research and training);

• dissemination of scientific knowledge (communication);

• training of gifted pupils (reproduction).

A scientific school is characterized by a set of features that make it possible to identify such a creative association of researchers.

The main feature of NSthere is effective assimilation and research by its members of actual problems from the scientific directions proposed by the leader. The minimum cycle, which gives reasons to record the existence of the school, consists of three generations of researchers: the founder of the school - his follower - the follower's students.

The key figure of the school is its leader, after whom the school is named. This is an outstanding, authoritative scientist who develops fundamental and general issues of science, produces ideas, new directions of research, is able to unite a group of like-minded people around him.

Among other signs of NS, the following are distinguished:

• long-term scientific productivity, characterized by both quantitative (number of publications, references) and qualitative indicators (leader and members of NS are authors of fundamental scientific works, members of editorial boards of leading professional journals and anthologies);

• the breadth of problem-thematic, geographical, and chronological ranges of the

functioning of the NS;

• preserving the traditions and values of the National Academy of Sciences at all stages of its formation and development, ensuring continuity in the areas of scientific research, the style of scientific work;

• development of an atmosphere of creativity, innovation, openness for scientific discussions both in the professional press and in communication;

• unification of a certain circle of talented scientists in the National Academy of Sciences, its constant renewal by gifted pupils - followers of the leader, capable of independent search;

• constant communication links (horizontal and vertical) between the teacher and students, ordinary members of the school;

• active pedagogical activity (number of applicants, graduate students, doctoral students, textbooks, training aids, development of new courses);

• official recognition by the state (scientific community) of the importance of scientific research of the National Academy of Sciences (the number of academicians, doctors, candidates of sciences, professors, associate professors, honored figures and employees).

It is believed that the leader of the NS is mainly a Doctor of Science. Its members must have at least three doctors of science in their specialty. The problems of students' scientific research must necessarily be related to the subject of the teacher - the leader of the school. Geographical location is sometimes cited as one of the characteristics of a school. This formal feature can be used as an additional feature in the process of identification of NS.

The most common method of identifying NS is the study of the flow of candidate and doctoral theses of scientists who are part of this informal collective. This approach is legitimate because it reveals the "teacher-student" relationship, which is especially important for higher education institutions. It is effective because it allows you to obtain specific results based on quantitative data on the dissertations defended under the supervision of a particular scientist, and indicates the correspondence of the subjects of the students' dissertations to the issues of the leader's dissertation.

Scientific schools are the main informal structure of science, making a significant contribution to its development. Their representatives, as a rule, achieve significant scientific results.

In Ukraine, great attention is paid to the training of scientific and scientific-pedagogical personnel, which has its own patterns, principles and specific characteristics.

In 1991, by a resolution of the Cabinet of Ministers of Ukraine, the Higher Attestation Commission of Ukraine (HAC of Ukraine) was established, which carries out the attestation of scientific personnel.

Training and certification of scientific and pedagogical personnelis carried out by the Attestation Commission of the Ministry of Education and Science, Youth and Sports of Ukraine.

In Ukraine, a normative-legal framework for the training of scientific and scientific-pedagogical personnel has been created, the main documents of which are

"Regulations on the Training of Scientific-Pedagogical and Scientific Workers", "Regulations on the Procedure for Conducting Candidate Examinations", "Procedure for Awarding Scientific Degrees and Awarding Academic Titles" , "List of specialties of scientific workers" and others. Since 1997 p. BAK of Ukraine publishes the "Bulletin of the Higher Attestation Commission", and since 1998 - the magazine "Scientific World".

Currently, the training of highly qualified scientific and scientific-pedagogical personnel is carried out in 25 branches of science in 600 scientific specialties.

The main forms of training of scientific and scientific-pedagogical personnel are post-graduate studies and doctoral studies.

One of the main forms of planned training of scientific, pedagogical and scientific personnel is a postgraduate course, which is created at higher educational institutions, scientific institutions and organizations that have the necessary personnel and material base. It is opened and liquidated by the Ministry of Education and Science, Youth and Sports of Ukraine or the Presidium of the National Academy of Sciences of Ukraine. The term of study in a post-graduate course with a break from production is three years, in a post-graduate course without a break from production - four years.

Doctoral studiesas the higher degree of the unified education system is created at higher educational institutions, scientific institutions and organizations that have the necessary scientific and material base. Doctoral training takes place separately from production and lasts up to three years, it is attended by candidates of sciences who have scientific achievements in the chosen field.

The mutual obligations of a postgraduate or doctoral student, the preparation of which is carried out by state order, and a higher educational institution are defined in a standard agreement, which provides for the timely completion of work on the dissertation, employment after the completion of postgraduate or doctoral studies, provision of appropriate working conditions, provision of orderly housing, etc., and liability of the parties in case of non-fulfillment of the terms of the standard agreement.

Persons with a higher education and a specialist or master's degree are admitted to postgraduate studies on a competitive basis.

Entrants to graduate school take entrance exams in a specialty (within the scope of the curriculum for a specialist or master's degree that corresponds to their chosen scientific specialty), in philosophy and one of the foreign languages within the scope of the current curriculum for higher education institutions of the IV accreditation level.

Each post-graduate student, simultaneously with his enrollment, is assigned a supervisor from among doctors of sciences or, by decision of the academic council, as an exception, candidates of sciences. The supervisor advises the graduate student on scientific issues, monitors the implementation of the approved individual plan and bears personal responsibility for the proper completion of the dissertation work.

The graduate student works according to an individual plan, reports on its implementation at least twice a year at the meeting of the department (department, laboratory), is annually certified by the academic supervisor.

During the period of study at the graduate school, the graduate student is obliged to:

• to pass candidacy exams in a specialty, one of foreign languages and philosophy;

• fully implement the individual plan of work on the dissertation;

• deeply master knowledge, practical skills, professional skills; to raise the general cultural level;

• master the methodology and methods of conducting scientific research;

• report on the progress of the dissertation at the meeting of the department (department, laboratory);

• defend a thesis or submit it to a specialized academic council.

Only persons who have the scientific degree of candidate of sciences, scientific achievements and published works in the chosen scientific specialty and who are able to conduct fundamental, research and applied scientific research at a high scientific level are admitted to doctoral studies.

The head of the university (scientific institution, organization) where the doctoral program is open sends the applicant's documents to the departments (departments, laboratories), which listen to the scientific reports of the candidates for admission, consider the detailed plans for work on the dissertation and draw a conclusion for each candidate about the possibility of admission to the doctoral program. The academic council of the university (scientific institution, organization) on the basis of the conclusion of the department (department, laboratory) within a month makes a decision on the enrollment of each person in doctoral studies.

To provide assistance to doctoral students in conducting dissertation research, scientific consultants from among highly qualified scientific and pedagogical personnel - doctors of science - are appointed at the place of their preparation. If necessary, doctoral students can be sent to leading domestic and foreign scientific centers.

Every year, doctoral students submit to the academic council of a higher educational institution (scientific institution) after a preliminary discussion at the department a report on the implementation of an individual work plan, based on the results of which their attestation is carried out and decisions are made about further stay in doctoral studies.

You can work on a doctor's and candidate's thesis independently, outside of doctoral and postgraduate studies. Independent work of degree holders on doctoral and candidate dissertations is one of the forms of training of scientific, pedagogical and scientific personnel.

The main normative document of the state regulation of the process of attestation of highly qualified scientific personnel is the "Procedure for awarding scientific degrees and awarding scientific titles", approved by the Cabinet of Ministers of Ukraine on June 28, 1997 under No. 644. The resolution was amended and supplemented by relevant government resolutions of August 5, 1998 No. 1241 and dated July 22, 1999 No. 1336.

This document defines the procedure for awarding the scientific degrees of doctor and candidate of sciences and assigning the scientific titles of professor,

associate professor and senior researcher.

According to this document, scientific degrees of doctor and candidate of sciences are awarded, and academic titles of professor, associate professor and senior research associate are awarded to persons who have a higher education, deep professional knowledge and significant achievements in a certain field of science, in pedagogical activity.

The right to award the scientific degrees of doctor and candidate of sciences, as well as to assign the academic title of senior researcher, has been granted to the Supreme Administrative Court of Ukraine. The Ministry of Education and Science, Youth and Sports of Ukraine is responsible for awarding academic titles of professor and associate professor.

The document certifying the award of a scientific degree is a diploma, and the awarding of a scientific title is a state certificate. The diplomas of doctor, candidate of sciences and the certificate of senior researcher are issued by the HAC, and the certificate of professor and associate professor is issued by the Ministry of Education and Science, Youth and Sports of Ukraine.

The scientific degrees of doctor and candidate of sciences are awarded by specialized scientific councils based on the public defense of the dissertation.

Scientific titles of senior researcher, associate professor, professor are assigned by academic councils of higher educational institutions and approved in accordance with the established procedure.

The most outstanding scientists are elected by meetings of the National Academy of Sciences of Ukraine, branch and public academies as corresponding members and full members - academicians. Scientific workers and employees of a higher school are awarded the honorary titles "Honored Worker of Science and Technology of Ukraine", "Honored Worker of a Higher School" and others for their great merits in science and pedagogy.

Research activities of students(NTDS) of higher educational institutions of Ukraine is one of the main factors in the training of highly qualified personnel of the relevant profile.

The concept of "research activity of students" includes two interrelated elements:

• teaching students elements of research activity, organization and methods of scientific creativity;

• scientific research carried out by students under the guidance of professors and teaching staff.

The NDDS of higher educational institutions is characterized by the unity of goals and directions of educational, scientific and educational work, close interaction of all forms and methods of scientific work of students, implemented in the educational process and extracurricular time. This ensures their participation in scientific activities during the entire period of study, which is closely related to both scientific and research activities carried out by units of higher educational institutions and public activities.

The content and structure of NDDS ensures the consistency of its means and forms in accordance with the logic and sequence of the educational process, which

determines the continuity of its methods and forms from course to course, from department to department, from one discipline to another, from one type of training to another, gradual growth volume and complexity of knowledge, skills, and abilities acquired by students in the process of their scientific work. The scientific and research activities of students implemented in the complex provide solutions to the following main tasks:

• forming a scientific outlook, mastering the methodology and methods of scientific research;

• providing assistance to students in accelerated mastering of a specialty, achieving high professionalism;

• development of creative thinking and individual abilities of students in solving practical tasks;

• instilling in students the skills of independent scientific and research activities;

• development of initiative, the ability to apply theoretical knowledge in one's practical work, involvement of the most capable students in solving scientific problems that are of significant importance for science and practice;

• the need to constantly update and improve one's knowledge;

• expanding the theoretical horizons and scientific erudition of the future specialist;

• creation and development of scientific schools, creative collectives, education of a reserve of scientists, researchers, and teachers within the walls of a higher educational institution.

The content and forms of NDDS correspond to the main areas of research activity of a higher educational institution, the basis of its organization and implementation are the departments. Highly qualified university teachers take part in the leadership of the NDDS.

VAT content is determined by:

a) problems of research and scientific-methodical activity of departments, faculties, universities;

b) the subject of research carried out by departments in creative cooperation with cultural and educational institutions, with all specialized institutions and organizations for higher education institutions;

c) the conditions of students' research work, the availability of a research base, the possibility of obtaining the necessary documents, the availability of computer equipment, the Internet and Intranet; provision of VAT by scientific management, etc.

Research activities of university students are carried out in three main directions:

•research work, which is an integral element of the educational process and is included in the calendar-thematic and educational plans, educational programs as mandatory for all students;

• scientific and research work carried out outside the educational process within SNTT - in circles, problem groups (laboratories), translation and information studios, folklore expeditions, etc.;

•scientific and organizational events: conferences, Olympiads, competitions, etc.

Research work of students within the educational processis mandatory for every student and covers almost all forms of educational work:

• writing abstracts of scientific literature on a specific topic in the process of studying disciplines of the socio-humanitarian cycle, fundamental and professionally oriented, selective disciplines;

• performance of creative and individual tasks, educational projects containing elements of problem-based research;

• execution of atypical tasks of an experimental nature during the period of production practice, on the order of enterprises, institutions, organizations, cultural institutions, etc.;

• development of methodical materials using experimental methods (glossaries, crosswords, etc.);

• preparation and defense of course and diploma theses related to the issues of scientific research of the graduate department.

The methodology of establishing and conducting NDDS in the educational process is determined by the specifics of the university, its scientific and material and technical base, acquired traditions.

To carry out this work, students receive a workplace in the department's laboratory, computer class, and library.

The clear organization of NDDS in the educational process promotes in-depth assimilation of special educational disciplines by students, allows to fully reveal their individuality, to form their own opinion about each discipline. At the same time, special attention is paid to the involvement of students in collecting, analyzing and summarizing the best practical experience, conducting sociological and experimental research, preparing reports and reports.

Scientific research workstudents outside the educational processis one of the most important means of forming highly qualified specialists. It provides:

• participation of students in the work of scientific circles, problem groups, creative sections, laboratories, etc.;

• participation of students in the performance of state-budget or self-financing scientific works, conducting research within the framework of creative cooperation of departments, faculties, computer center with institutions of culture, education, etc.

Materials for self-control:

AND. Questions for self-control:

B. Test tasks and problems

Summing up.

List of recommended literature

Main:

1. Gutorov O.I. Methodology and organization of scientific research: study guide. Kharkiv: KHNAU, 2017. 272 p.
2. Danilyan O.G., Dzoban O.P. Organization and methodology of scientific research: teaching. manual Kharkiv: Pravo, 2017. 448 p.

3. Degtyarev A.V., Kokodiy M.G., Maslov V.O. Fundamentals of scientific research: a study guide. Kharkiv: KHNU named after V. N. Karazina, 2016. 78 p.
4. Kostyukevich V.M., Konnova M.V. Methodology of scientific research: study guide. Vinnitsa. 2017. Vol. 172.
5. Malyhina V.D. Methodology of scientific research. Rivne. 2016. 247 p.
6. Methodology of scientific research: teaching manual. / V.I. Zatserkovnyi, I.V. Tishaev, V.K. Demidov – Nizhyn: NSU named after M. Gogol, 2017. – 236 p.
7. Methodology of scientific research in medicine: teaching. manual / V.D. Babajan, N.S. Bakumenko, O.I. Kadykova and others; under the editorship P.G. Kravchuna, V.D. Babajana, V.V. Meat eater. – Kharkiv: KhNMU, 2020. – 260 p.

Additional:

1. Puzanova O. G. Information provision of evidence-based health care. Part I. / O. G. Puzanova, T. S. Gruzheva // Proof. honey. – 2014. – No. 4 (16). - P. 23-33.
2. Skakun M. P. Fundamentals of evidence-based medicine: monograph / M. P. Skakun. - Ternopil: Ukrmedknyga, 2005. - 244 p.
3. Chernobrovy V. M. Health, pre-disease, disease: medical and social aspects and assessment. Risk factors. Preventive medicine: a guide for graduate students, interns, general practitioners - family medicine / V. M. Chernobrovyi, S. G. Melashchenko, T. M. Tkachuk. – Vinnytsia: Planer, 2013. – 80 p.
4. Shulyak V. I. International experience of using an integrated clinical protocol in medical practice (literature review) / V. I. Shulyak // Ukr. honey. magazine – 2010. – No. 5 (79). - P. 41-44.
5. Howick J. The Philosophy of Evidence-Based Medicine / J. Howick. - Oxford: Blackwell-Wiley, 2011. - 238p.

Electronic information resources:

1. Best Evidence. URL: http://www.bestevidence.com/
2. BritishMedicalJournal. url http://www.bmj.com/specialties/evidence-based-practice
3. CanadianMedicalAssociation. URL: http://www.cma.ca/
4. Center for Evidence-based Medicine at the University of Oxford. URL: http://www.cebm.net/
5. Clinical Evidence. URL: http://clinicalevidence.bmj.com/x/index.html
6. Cochrane Collaboration open learning material for reviewers. URL: http://www.cochrane-net.org/openlearning
7. Cochrane Library. URL: http://www.thecochranelibrary.com/
8. Current Controlled Trials. URL: http://www.controlled-trials.com/mrct
9. eGuidelines. URL: http://www.eguidelines.co.uk/
10. Evidence-Based Medicine. URL: http://ebm.bmj.com/
11. Canada Clinical Guidelines Database. URL: http://www.phac-aspc.gc.ca/
12. JAMAEvidence. URL: http://www.jamaevidence.com/
13. Medscape. URL: http://www.medscape.com/
14. National Institute for Clinical Excellence. URL: http://www.nice.org.uk/
15. PRODIGY (Clinical Guidance). URL: http://prodigy.clarity.co.uk/

Practical lesson No. 5

SUBJECT: "Basics of preparing a scientific publication" - 2 hours

Goal:familiarization with the characteristic features and procedure for preparing scientific publications for publication.

Basic concepts:

Term	Definition
Edition	— a document that has undergone editorial and publishing processing, produced by printing, embossing or another method, contains information intended for distribution and meets the requirements of state standards, other normative documents regarding publishing design and polygraphic execution.
Monograph	—— is a scientific work that contains a complete or in-depth study of one problem or topic, which belongs to one or more authors.
Scientific report	is a public announcement that informs about scientific observations, experiments, their results, new discoveries, and summarizes scientific data.
Scientific publication-	- this is bringing information to the public with the help of the press, radio broadcasting, television; placement in various publications (newspapers, books, textbooks).
Scientific Article	is a publication in a collection, magazine or newspaper, in which intermediate or final results are presented, specific individual questions on the research topic are highlighted, and the scientific priority of the author is fixed.
Scientific edition	- publishing the results of theoretical or empirical research, as well as cultural monuments, historical documents, and literary texts prepared by scientists for publication.
Scientific specialist edition	is a magazine or other periodical included in the lists of publications approved by the Supreme Administrative Court of Ukraine in which articles may be published the results of dissertations for obtaining scientific degrees of doctor and candidate of sciences and which can be referred to in scientific articles and dissertations.
Scientific journal	- a printed periodical containing articles and research materials of a theoretical or applied nature and intended primarily for specialists in a certain field of science.
Abstract	- a summary of the content of one or more sources on a certain topic.
Abstracts of the report	- these are preliminary materials published at the beginning of a scientific conference (congress, symposium), containing an outline of the main aspects of a scientific report.

Actuality of theme

For a future specialist, scientist, it is very important to master the methodology of preparing a scientific publication. Writing an abstract, a scientific article, abstracts of reports at a conference must meet the requirements of the publication genre and be perceived by readers and listeners accordingly. This puts certain demands on the logic of their construction, form, style and language.

Plan

I. Organizational moment (greetings, checking those present, announcing the topic, the purpose of the lesson, motivating students to study the topic).
II. Control of basic knowledge: Theoretical questions for the lesson:

III. Formation of professional skills and abilities. Practical works (tasks) performed in class:

- Open reporting forms for scientific research;
- Functions and types of scientific research;
- Designing the research results;
- The technique of working with scientific literature.

Topic content:

For a future specialist, scientist, it is very important to master the methodology of preparing a scientific publication. Writing an abstract, a scientific article, abstracts of reports at a conference must meet the requirements of the publication genre and be perceived by readers and listeners accordingly. This puts certain demands on the logic of their construction, form, style and language.

Let's consider the method of preparation of certain types of publications or speeches, taking into account the peculiarities of each type, the dependence on the level of completeness of the research, as well as taking into account the circle of readers or listeners for whom they are intended.

Scientific publication(from the Latin publicato - I announce to the whole nation, make public) - this is bringing information to the public with the help of the press, radio broadcasting, television; placement in various publications (newspapers, books, textbooks).

The main functions of scientific publications:

- publication of the results of scientific work;
- assistance in establishing the author's priority for scientific articles similar in content;
- evidence of the researcher's personal contribution to the development of a scientific problem;
- confirmation of the authenticity of the main results and conclusions of the scientific work, its novelty and scientific level, since the publication becomes an object of study and evaluation by the general scientific community after its publication;
- confirmation of the fact of approval and implementation of the results and

conclusions of the dissertation;

- display of the main content, scientific level and novelty of the research;
- provision of primary scientific information to the society, notification of the emergence of new scientific knowledge, its transfer for general use.

Of particular importance are scientific publications published in the form of publications. State Standard of Ukraine 3017-95 "Edition. The main types. Terms and definitions" defines the publication as a document that has undergone editorial and publishing processing, produced by printing, embossing or other means, contains information intended for distribution and meets the requirements of state standards, other regulatory documents regarding publishing design and polygraphic execution.

The publication is considered scientificresults of theoretical or empirical research, as well as cultural monuments, historical documents, and literary texts prepared by scientists for publication. It is intended for specialists in the relevant field and scientific work.

Scientific publications can be of two groups(Fig. 1):

- research;
- source studies.

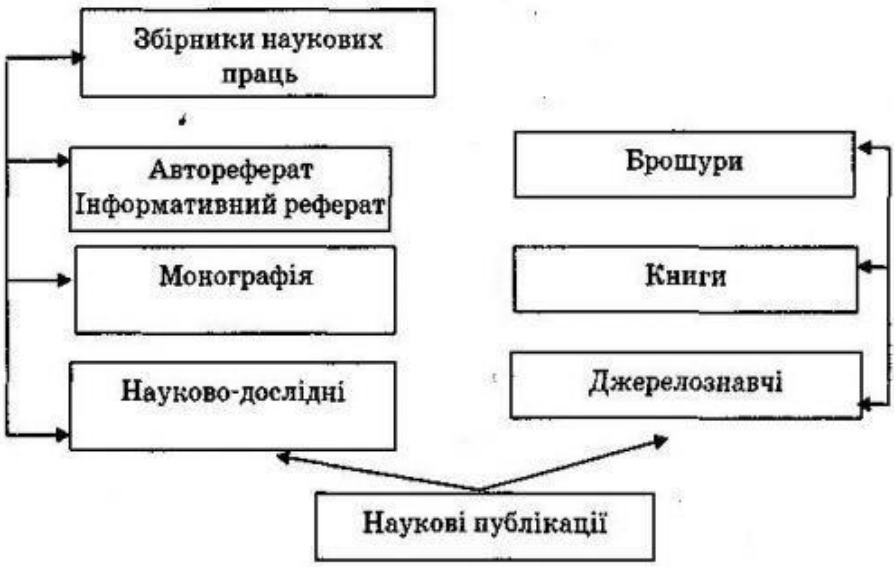


Fig. 1. List of scientific publications

Scientific research includes:

- monograph (scientific work devoted to the study of one topic);
- scientific abstract (author's abstract) - a brief presentation by the author of the content of the scientific research, dissertation before submitting it for defense;
- informative essay - a short written presentation of one scientific work, which briefly highlights its content. It emphasizes new messages;
- abstracts of reports, as well as materials of the scientific conference (non-periodic collection of conference results, reports, recommendations and decisions);
- collections of scientific works (periodical collections of research materials, scientific articles, completed in scientific institutions, educational institutions).

Source studies scientific publications include:

- source studies publications or scientific documentary publications that contain cultural monuments;

- historical documents that have undergone textological processing, have comments, introductions, articles, auxiliary indexes, etc.

Among scientific non-periodical publications, we can highlight:

- books (a book edition of more than 48 pages);
- brochures (book edition with volume from 4 to 48 pages).

The status of a scientific publication requires strict compliance with the requirements of the publishing design of the publication. Let's focus on the main ones:

Source information(DSTU 4861:2007) is a collection of data that characterizes the publication and is intended for its design, bibliographic processing, statistical accounting and informing the reader. These are: information about the authors; publication title (name); header data; subtitle data; numbering; publication storage code; UDC index; BBK index; copyright sign; layout of an annotated catalog card; copyright protection sign; international standard ISBN number; initial and final data.

Output data(placed in the lower space of the title page) include: place of publication, name of the publishing house, year of publication.

Graduation data(located on the last page) include: the date of submission of the original to the publication; date of signature of the publication to be printed; paper format and sheet size; paper type and number; font typeface of the main text; printing method; the volume of the publication in conditional printed sheets reduced to the format of a paper sheet of 60x90 cm; volume of publication in accounting and publishing sheets; order number of the printing company; the name and postal address of the publishing house and the printing company. Graduation data are placed on the last page of the publication or on the back of the title page.

Articles of a scientific nature are published mainly in scientific periodicals - anthologies or magazines.

Scientific journal- a printed periodical containing articles and research materials of a theoretical or applied nature and intended primarily for specialists in a certain field of science.

By purpose, scientific journals are divided into:

- scientific and practical;
- scientific and theoretical;
- scientific and methodical.

Authors have certain difficulties in determining the volume of works, which is caused by insufficient knowledge of the basic units of calculation of scientific information distributed by means of printing. They include:

- author's sheet;
- printed sheet;
- accounting and publishing sheet.

The most widely used in practice is the author's sheet - it is a unit of the volume of a printed work, which is equal to 40,000 printed characters (letters,

numbers, punctuation marks, each space between words, etc.), one author's sheet is equal to 24 pages of typewritten text printed at 2 intervals on a standard sheet A4 format.

The volume of the original in the author's sheets can be roughly determined by dividing the total number of pages of the typewritten text by 24. The volume of the manuscript in the publishing contract is determined in the author's sheets.

Printed sheet- a unit of measurement of the natural volume of the publication, which is equal to a printed impression on one side of a paper sheet. There are physical and conventional printed sheets.

*Physical printed sheet*is equal to half of a paper sheet in standard formats (in cm) 60×84, 60×92, 70×92, 70×108, 84×108 and close to them. When printing on one side, a sheet of paper contains one physical printed sheet. When printing on both sides, a sheet of paper contains two physical printed sheets.

Conditional printed sheet– a conventional unit of publication volume, which is equal to a printed sheet of 60x90 cm format and is intended for calculating and comparing the printed volume of publications of different formats.

Accounting and publishing sheet- is a unit of accounting for a printed work, which is equal, as an author's sheet, to 40,000 printed characters of prose text, 700 lines of poetic text or 3,000 cm2 of advertising illustrated text.

In the accounting and publishing sheets, those parts of the publication that are not the result of the author's work are taken into account (publishing abstract, table of contents, original information on the cover, file, graduation data, serial page numbers, editorial preface, figure, etc.).

The scientific results of the holders of the scientific degree of doctor or candidate of sciences are counted only if they are published in specialized scientific publications.

Scientific specialist editionis a journal or other periodical publication included in the lists of publications approved by the Supreme Administrative Court of Ukraine in which the results of dissertations for obtaining the scientific degrees of doctor and candidate of sciences can be published and which can be referred to in scientific articles and dissertations.

Periodical scientific publications may be included in the lists approved by the Supreme Administrative Court of Ukraine under the following conditions:

1. The presence in the composition of the editorial board of at least three doctors of science from the relevant field of science - full-time employees of the scientific institution of the organization or higher educational institution of the founding organization of the publication.
2. The journal (periodical publication) is signed for publication only on the recommendation of the scientific council of the scientific institution, organization or higher educational institution that publishes it, which is indicated in the source data.
3. Circulation of at least 100 copies.
4. Full compliance with the requirements for the editorial design of the magazine (periodical) in accordance with the state standards of Ukraine.

5. Availability of the magazine (periodical) in the funds of the main libraries of Ukraine.
6. Publication of an electronic copy of the periodical on the website of the V. I. Vernadskyi National Library of Ukraine.

The publication of no more than one article by the winner on the topic of the dissertation in one issue (issue) of a magazine (or other printed publication) is counted.

Works that do not have a complete description of scientific results, which proves their reliability, or that repeat results published earlier in other scientific works included in the main list, are not included.

Electronic scientific publication- a document in which information is presented in the form of electronic data, which has undergone editorial and publishing processing, is intended for distribution in an unchanged form, has original information and is included in the approved lists of publications in which the results of dissertations for obtaining scientific degrees of a doctor can be published and candidate of sciences and which can be referred to in scientific articles and dissertations.

The number and quality of publications on the research topic is a criterion for evaluating the work.

It is considered that the dissertation is completed at the proper level if it is possible to prepare an article from each of its sections and subsections, and a monograph based on its general results.

When defending a doctoral dissertation, the applicant must publish a monograph of at least 10 printed pages and at least 20 articles in leading scientific journals of Ukraine (for humanities and social sciences), at least 15 publications of the main content of the dissertation (for natural and technical sciences).

The number of publications can be changed if:

- the total volume of individual publications exceeds 5 author's sheets.
- the acquirer has a significant total number of publications.

If the total number of articles is at least 20, the number of individual articles must be at least five. If the total number of articles is at least 30, the number of individual articles should be at least four. In general, the HAC appreciates when the majority of publications are without co-authors and all are published before the thesis is accepted for defense. Sections of monographs, textbooks, training manuals written by the author personally are equivalent to articles without co-authors.

For a candidate of science degree:

- a minimum number of publications of at least three articles of the main content of the dissertation in the form of articles in scientific specialized publications of Ukraine or other countries; the list of which is approved by the Supreme Administrative Court of Ukraine.

- Only those articles in scientific specialized publications that were out of print at the time of acceptance of the dissertation for defense are counted.

The published works, which additionally reflect the scientific results of the dissertation, include copyright certificates for inventions, state standards, industrial

samples, manuscripts of works deposited in institutions of the state system of scientific and technical information and annotated in scientific journals, brochures, information cards for new materials introduced to the state data bank, abstracts of reports, materials presented at scientific conferences, congresses, symposia, seminars, etc. Abstracts of reports are included in the list of published works, provided that they serve to establish priority, or when their content is not presented in other publications.

Scientific publications (in particular, scientific monographs, magazines or collections), in which the main results of dissertation works are published, must be available to the reader, be in the collections of leading domestic libraries, and must be sent to the established list of institutions approved by the Supreme Administrative Court of Ukraine. They include:

- National Library of Ukraine named after V. I. Vernadskyi (03039, Kyiv, 3 40th Anniversary of October Avenue);
- National Parliamentary Library of Ukraine (01601, Kyiv, 1 Hrushevsky St.);
- State Scientific and Technical Library of Ukraine 901171, Kyiv-171, str. Gorky, 180);
- Lviv State Scientific Library named after V.S. Stefanyka (79001, Lviv, 2 Stefanyka Street);
- Odesa State Scientific Library named after M. Gorky (65020, Odesa, Pastera St., 13);
- Kharkiv State Scientific Library named after V.G. Korolenko (61003, Kharkiv, Korolenko ave., 18);
- Book Chamber of Ukraine (27, Gagarina Ave., Kyiv, 02094).

Therefore, scientific publications (including scientific monographs) in which publications on the main content of dissertations can be included are considered to be only those publications that have arrived at the listed institutions.

Each scientist systematically keeps records of his own publications in a file list or a computer data bank according to the scheme: title of work; nature of work; output data; volume in author's sheets; term and title of publication. You must have originals or copies of your own publications.

Monograph- is a scientific work that contains a complete or in-depth study of one problem or topic, which belongs to one or several authors. There are two types of monographs: scientific and practical.

Scientific monograph- this is a research work, the subject of which is an exhaustive generalization of theoretical material on a scientific problem or topic with its critical analysis, determination of importance, formulation of new scientific concepts. The monograph fixes scientific priority, provides society with primary scientific information, serves to highlight the main content and results of scientific, dissertation research.

A scientific monograph is characterized by the unity of content and it testifies to the scientific contribution of the recipient to science and is considered as a qualifying scientific work. Under these conditions, it replaces the dissertation work. The volume of the individual monograph of the recipient of the Doctor of Science degree, which is counted as a dissertation, must be at least 10 author's pages in the field of technical and natural sciences and at least 15 author's pages in the field of

humanities and social sciences.

Practical monograph- this is a scientific work, which is a means of highlighting the main content of the dissertation and one of the main publications on the topic of research, while the following requirements are put forward to it:

- volume - at least 10 accounting and publishing sheets;
- availability of reviews of two doctors of science, according to the relevant specialty;
- availability of a recommendation from the scientific council of a research institution or higher educational institution;
- circulation of at least 300 copies;
- availability of an international standard ISBN number.

There are certain differences between a dissertation and a monograph.

First, the dissertation provides a presentation of scientific results and conclusions obtained personally by the author.

A monograph is a statement of results, ideas, concepts that belong to both the recipient and other authors.

Secondly, the dissertation contains new scientific results, conclusions, and facts, and the monograph can present both new results and methodical, technical solutions, facts that are already known.

Thirdly, the dissertation according to the requirements of the HAC has a defined structure and rules of design, which must be followed. Monographs are not subject to such requirements.

Fourthly, the dissertation is a manuscript that is kept in a limited number of copies in certain library institutions. A monograph is a publication that has undergone appropriate editorial and publishing processing, produced by a printing or other method, published by a specialized publishing house of Ukraine.

The dissertation is completed in accordance with the requirements of state standards regarding printing and design, which is not established for a monograph and its structure.

Traditionally, the compositional structure of a scientific monograph has developed: a title page, an abstract, a list of notations (if necessary), an introduction or

preface, main body, conclusions or afterword, references, auxiliary indexes, appendices, table of contents.

The monograph is primarily intended for scientists and should correspond in content and form to the genre of the publication. Of particular importance here are the clarity of the wording and presentation of the material, the logic of highlighting the main ideas, concepts, and conclusions. its volume should be at least 6 printed sheets. The requirements for the essence of the presentation of the material in the sections of the monograph are similar to the requirements of other scientific publications with certain features of their purpose.

Scientific Article- a publication in a collection, magazine or newspaper, in which intermediate or final results are presented, specific individual questions on the research topic are highlighted, and the scientific priority of the author is fixed.

The scientific article is submitted to the editors in a completed form in

accordance with the requirements, which are published in separate issues of magazines or collections in the form of a memo to the author. The optimal volume of a scientific article is 0.5 - 0.7 auto. sheets.

The manuscript of the article must have the full title of the work, the author's last name and initials, an abstract, and a list of references.

The article has a simple structure:

- introduction (statement of the scientific problem, relevance, connection with the most important tasks facing Ukraine, importance for the development of a certain field of science and practice - 1 paragraph or 5-10 lines);

- the main researches and publications on the problem for the last time, on which the author relies, the problem of highlighting the unresolved issues to which the article is devoted (0.5-2 pages of typewritten text);

- formulation of the purpose of the article (statement of the task) - the main idea of this publication is expressed, which is significantly different from modern ideas about the problem, complements or deepens already known approaches; attention is drawn to the introduction into scientific circulation of new facts, conclusions, recommendations, regularities or clarification of previously known, but insufficiently studied. The purpose of the article follows from the statement of the scientific problem and review of the main publications on the topic (1 paragraph or 5-10 lines);

- an outline of the content of one's own research - the main part of the article. It highlights the main provisions and results of scientific research, personal ideas, opinions, obtained scientific facts, and the program of the experiment. Analysis of the obtained results, the author's personal contribution to the implementation of the main conclusions, etc. (5-6 pages);

- the conclusion, which formulates the main conclusion of the author, the content of conclusions and recommendations, their significance for theory and practice, social significance and prospects (1/3 page).

In accordance with the resolution of the Presidium of the Supreme Administrative Court of Ukraine dated 15.01.2003 No. 705/1, scientific articles are considered professional if the following necessary elements are present:

statement of the problem in a general form and its connection with important scientific or practical tasks; analysis of the latest research and publications, in which the solution to this problem was initiated and on which the author relies, selection of previously unresolved parts of the general problem, to which the article is devoted; formulation of the goals of the article (statement of the task); presentation of the main research material with full justification of the obtained scientific results; conclusions from this study and prospects for further research in this direction.

Certain rules should be followed when writing a scientific article:

- the author's surname and initials are placed in the upper right corner; if necessary, information supplementing the author's data is indicated;

- initials are placed before the surname;

- the title of the article succinctly reflects its main idea, thought (preferably up to five words);

- the style of a scientific report should be avoided;

- it is inappropriate to ask rhetorical questions, to use more narrative sentences;

- do not overload the text with numbers when listing certain opinions, provisions, requirements;

- the use of phrases from the list is acceptable in the text: "at first", "of course", "in the beginning", "first", "then", "really", "further", "finally", "first", " secondly", "perhaps", "intended", "given", "among other things", "in connection with that", "in contrast", "next to this", etc.

- citations in the article are used very rarely (you can make a reference in brackets to the scientist who first investigated the problem);

- all references to authorities are provided at the beginning of the article, the main volume is devoted to the presentation of the author's own opinions;

- the article should end with specific conclusions and recommendations and a list of used sources should be attached.

The manuscript of the article is signed by the author and submitted (together with the diskette) to the editors in two copies. In some cases, an abstract (summary) in Ukrainian, Russian and English is given in a scientific article for specialized publications.

Theses(from thesis - position, statement) is a briefly, precisely, consistently formulated ideas, thoughts, position of a scientific report, message, article or other scientific work.

Abstracts of the report- these are preliminary materials published at the beginning of the scientific conference (congress, symposium), containing an outline of the main aspects of the scientific report.

They are evidence of approval of research work. It should be said that approval of scientific work at scientific conferences and seminars is mandatory when writing a dissertation.

The volume of theses can be within 2-3 pages of typewritten text at 1.5-2 intervals.

The thesis algorithm can be presented as follows:

thesis - justification - proof - argument - result - perspective.

The abstracts of a report or any scientific publication are drawn up in accordance with the following requirements:

- the author's surname and initials are placed in the upper right corner and supplemented with information about him;

- the title of the theses of the report briefly reflects the main idea, opinion, position (2-5 words);

- the sequence of content can be as follows: relevance, problems; the state of problem development in science and practice; the main idea, provisions, conclusions of the study; main results and their practical significance. Theses usually do not use citations or digital material.

The formulation of each thesis begins with a new line, each thesis has an independent opinion expressed in one or more sentences.

Already from the first year of study at the university, students must be able to prepare an essay, a speech at a seminar, a report at a scientific and practical conference. What requirements should be followed during their preparation and

registration.

Abstract(from Latin referre - to report, to report) - a summary of the content of one or more sources on a certain topic. When working individually with literature, an essay is a short enriched record of ideas from several sources. Often, an essay is prepared in order to convey these ideas to the audience.

The scope of the abstract depends on the chosen topic, the content of the documents, their scientific value or practical significance.

There are two types of essays: productive and reproductive. A reproductive essay reproduces the content of the original text. Productive includes creative or critical interpretation of referenced sources.

Reproductive essayscan be divided into two more types: abstract-summary and abstract-summary. Abstract summary contains factual information in a generalized form, illustrated material, various information about research methods, research results and possibilities of their application. The abstract-summary contains only the main provisions of this topic.

In productive essays, there is an essay-report and an essay-review. The abstract-review is compiled on the basis of several sources and compares different points of view on this issue. In the abstract-report, along with the analysis of the primary source information, there is an objective assessment of the problem; this essay is extensive in nature.

Algorithm of the structure of the essay:

- Introduction
- Chapter 1. History and theory of the issue
- Chapter 2. Solving the problem in modern conditions
- Conclusions
- References
- Appendices (if necessary).

The introduction substantiates the relevance of the topic, its specificity and significance in a specific field of science or practice.

Chapter 1 presents the main theoretical and experimental studies on the topic. A list of the main substantive aspects of the problem, which were previously considered by scientists, is presented, insufficiently researched issues are identified, and the reasons for their weak development are clarified.

Chapter 2 provides an in-depth analysis of the current state of the process or phenomenon, interpretation of the main views and positions of the problem. Particular attention is paid to the discovery of new ideas and hypotheses, experimental data, new methods of studying the problem, practical experience and expressing one's own opinion regarding the prospects for the development of the investigated problem.

The conclusions contain the scientist's generalized conclusions, ideas, opinions, evaluations, and suggestions.

The list of used sources mainly includes publications of the last 5-10 years. The works of the last year of publication are especially appreciated.

Formulas, tables, diagrams are given in the appendices, if they significantly facilitate the understanding of the work.

Students choose the topic of the essay in accordance with the topic approved by the department and in agreement with the academic supervisor.

The volume of the extended abstract is 20-24 pages.

The presentation of the material in the abstract should be short and concise. The abstract uses standardized terminology, the meaning of which is clear from the context.

The abstract is reviewed, evaluated and taken into account during the final assessment, exam in the relevant discipline.

A review (feedback) of an essay or other research work should objectively assess its positive and negative aspects. In the review, to one degree or another, the author's ability to pose a problem, justify its social significance, the author's understanding of the relationship between the real problem and the level of its conceptuality should be evaluated; complete coverage of literary sources; the depth of their analysis, mastery of collection methods; analysis and interpretation of empirical information; independence of work, originality in understanding the material; justification of conclusions and recommendations.

The style of the review should comply with the norms adopted for scientific reviews, that is, be friendly, but principled.

Regarding the author of the work, sentences should be built in the third person of the past tense ("The student put..., revealed..., proved..., substantiated") to the work itself - in the present tense ("the abstract contains..., reveals. .., confirms...").

The review should not end with an assessment, it should flow organically from the content of the document.

Reports are a fairly common form of publicizing the results of scientific research.

Report- a public message on a certain topic.

The following types of reports are distinguished:

1) political;
2) business;
3) reporting;
4) scientific.

Scientific report- this is a public announcement, which informs about scientific observations, experiments, their results, new discoveries, and summarizes scientific data. Of course, such reports are heard in scientific institutions, at various gatherings of scientists, conferences, symposia, etc.

The structure of the text of the report is similar to the plan of the article.

Algorithm of the text of the report:

Introduction - The main part - The concluding part

In the introduction, the problematic situation that led to the need for a public speech is noted, then the main idea of the author is substantiated, arguments, facts, theoretical statements are given, and finally, conclusions and recommendations.

Compared to a scientific publication, a public report has its own characteristics. There are two methods of writing a report.

1. The researcher first prepares the theses of his presentation and based on them writes a report for a seminar or conference, edits and prepares for publication in

a scientific collection, as a report or an article.

2. The researcher writes a report, and then introduces it to the audience in an abbreviated form.

When writing a report, it should be taken into account that a significant, essential part of it is printed in abstracts, part - on slides, tapes, posters, therefore the speaker only gives separate comments to the illustrated material, published abstracts. This allows you to save the performance time by 20-40%. It is appropriate to refer to previous speeches, the polemical nature of the reports, which arouses the interest of the listeners.

When forming the content of the report, it should be taken into account that in 10 minutes a person can read the text printed on four pages of typewritten text (with two intervals). The length of the report is 8-12 pages (up to 30 minutes).

The report can be 4-6 pages long.

When preparing a scientific publication, report, speech, you should avoid:

- inaccuracies and vagueness of wording of the name;
- uncertainty of personal contribution to research;
- an overview of the contents and results of the research;
- duplication of the content of publications;
- a fairly short period of publication of the results of the dissertation.

At the same time, the texts of monographs, abstracts, speeches must correspond to the topic and content of the research work.

The results of scientific research can culminate in the writing of books, in particular textbooks and teaching aids. Let's consider their features and structure.

Textbook- an educational publication that contains a systematic presentation of the content of the academic discipline, corresponds to the program and is officially approved as such a type of publication.

Tutorial- an educational publication that partially or completely replaces or supplements a textbook and is officially approved as such a publication.

They are approved by the Ministry of Education and Science of Ukraine as normative publications with the appropriate seal. Assigning the seal means that the textbook or study guide meets the established requirements for compliance with the curriculum in terms of content, volume and technical design.

The following requirements must be taken into account when creating textbooks and educational and methodological guides:

- textbooks must have a high scientific and methodical level, contain appropriate reference apparatus;
- textbooks and teaching aids should be written in an accessible form, the educational material should be related to practical tasks, close inter-subject connections should be traced in the book;
- in textbooks and manuals, it is necessary to increase attention to the issues of their professional orientation, taking into account the use of computers.

The structure of the textbook provides for:content (list of sections); introduction (preface); main text; questions, tests for self-control, mandatory and additional tasks, examples; reference and informational data for solving problems

(tables, diagrams, etc.); bibliographic list; a device for orientation in the book's materials (subject, name indexes), appendices that are directly relevant to the book's topic.

Thus, each researcher and scientist chooses the most suitable way to transform the so-called draft version of the manuscript into the final type of scientific work.

6.5. Conclusions.

It is very important for a scientist to master the methodology of preparing a scientific publication - bringing information to the public with the help of the press, radio broadcasting, television; placement in various publications (newspapers, books, textbooks).

Of particular importance are scientific publications published in the form of publications. Publication of the results of theoretical or empirical research, as well as cultural monuments, historical documents, and literary texts prepared by scientists for publication, is considered scientific. The status of a scientific publication requires strict compliance with the requirements of the publishing design of the publication.

Articles of a scientific nature are published mainly in scientific periodicals - anthologies or magazines. The scientific results of the holders of the scientific degree of doctor or candidate of sciences are counted only if they are published in specialized scientific publications.

*Monograph*is a scientific work that contains a complete or in-depth study of one problem or topic, which belongs to one or several authors. There are two types of monographs: scientific and practical.

*Scientific Article*is a publication in a collection, magazine or newspaper, in which intermediate or final results are presented, specific individual questions on the research topic are highlighted, and the scientific priority of the author is fixed.

Abstracts of the report- these are preliminary materials published at the beginning of the scientific conference (congress, symposium), containing an outline of the main aspects of the scientific report.

Abstract- a summary of the content of one or more sources on a certain topic.

Report- a public message on a certain topic.

The results of scientific research can also lead to the writing of books, including textbooks and teaching aids.

Summary of questions for independent study on the topic.

The publication of any materials is an individual matter of the researcher. The style and method of their preparation depends on the creativity and intention of the author, his own understanding of the problem. At the same time, various methodical methods of presentation of scientific material can be used, in particular:

1) consistent;

2) complete (with subsequent processing of each part, section);

3) selective (chapters are written separately).

Sequential presentation of the materiallogically dictates the publication preparation scheme: idea (idea), plan, selection of material; grouping, its systematization, editing.

The sequence of presentation of the material is followed here, repetition is excluded; but of course, there is an unnecessary expenditure of time for sequential

processing of information;

A holistic way- this is writing the entire work in a draft version, and then processing it in parts and details, making additions, corrections. This saves time, but there is a danger of breaking the sequence of the presentation of the material.

Selective presentationmaterial is often used by researchers as they see fit. At the same time, it is important to bring each section to the final result, so that when combining the sections as a whole, the material is ready for publication.

In the process of writing a scientific work, several stages are conventionally distinguished: formation of the idea and preparation of the preliminary plan; selection and preparation of materials, grouping them and processing the manuscript.

At the first stagethe idea formulates the purpose of this work, for which circle of readers it is intended, what materials to present in it; the completeness and thoroughness of the presentation is assumed; theoretical and practical direction; what illustrative materials are necessary to reveal its content. The preliminary title of the work is determined, which can be adjusted later.

It is advisable to immediately draw up a work plan or a prospectus plan, which is required by the publishing house.

The plan-prospectus reflects the idea of the work and reproduces the structure of the future publication.

The selection and preparation of materials is related to the thorough quality of the source material in any sequence, separate parts, that is, everything that will be needed at the next stages of work on the manuscript.

The next stageinvolves the grouping of materials according to a preliminary prospectus plan and the classification of the work is determined in parallel, that is, its division into logically subordinated elements-parts, sections, subdivisions, points, otherwise, the creation of a draft layout of the work.

When processing the manuscript, its content is clarified, the conclusions are evaluated, the logic and consistency of the presentation of the material, the correspondence of the titles of the work and its sections to the content presented in them, the argumentation of the main provisions, the novelty of the theoretical and practical significance of the work are checked.

Its design and literary editing are quite important in the preparation of a white manuscript.

After writing the text, the author evaluates it practically and in principle: each conclusion, formulas, tables, individual sentences are reread, conclusions, arguments, facts, theoretical and practical significance of the publication material are checked;

The correctness of the design of the manuscript is analyzed: literary sources, citations.

The manuscript prepared for submission to the publishing house must meet certain requirements determined by the process of its further preparation for printing, most of which have already been discussed. In summary, they should be as follows:

- the author's original text (manuscript) includes a title page, an abstract (and for scientific publications - an abstract), the main text, reference texts and additional texts (indexes, comments, notes, appendices), bibliographic lists, references, table of contents;

- submit the text of the manuscript and all related materials to the publisher in two copies;

- manuscript pages must be of the same size (from 203x288 to 210x297 mm);

- the material should be printed by computer in small letters after two intervals on one side of the sheet;

- one line should contain 60-65 characters (counting punctuation marks and spaces between letters), one page of continuous text - 28-30 lines;

- when determining the volume of the manuscript, it is necessary to assume that there are 40,000 characters in one author's sheet;

- margins of the original pages must be: left - at least 20 mm, top - 20, right - 10, bottom - 20;

- the paragraph should be the same and equal to three beats:

- print all headings and selections in the text in lowercase letters, separate the headings from the text above and below with spaces of three intervals;

- links are placed at the bottom of the page, they are not transferred to the next page;

- all necessary, in the opinion of the author, allocation of letters and parts of the text are noted in the manuscript;

- clearly define the subordination of headings and subheadings;

- corrections in the manuscript are allowed, but no more than five on one page; they can be typed or handwritten in black ink; extra letters or words can be erased, glued or painted over;

- the pages of the manuscript are consecutively numbered, starting from the cover to the last page, in the upper right corner - with a simple pencil; indicate the total number of pages and illustrations on the title page;

- the manuscript is signed by the author (co-authors) or the editor on the title page with an indication of the date;

- illustrative materials are made clearly, in a format that ensures understanding of all details with a possible reduction of the image.

For textbooks, in addition to two external positive reviews, reviewed by academic councils of higher educational institutions by the relevant scientific and methodical commissions of the Scientific and Methodical Council of the Ministry of Education and Science, Youth and Sports of Ukraine, they are submitted for approval to the board of the ministry, and educational and methodical manuals - to the deputy state secretary.

According to the order of the Ministry of Education of Ukraine No. 70 dated 02.06.98, textbooks, manuals and other educational and methodological literature for higher educational institutions are provided with labels that establish the purpose and type of the textbook and are indicated on the title page, and on the back it is indicated by whom and when a decision is made to grant vultures.

The collegium of the Ministry of Education and Science, Youth and Sports of Ukraine provides vultures:

- "Approved by MONMSU" - textbooks that need to be reissued;

- "MONSU approved" - textbooks and training manuals for disciplines provided for by the branch component of state standards of higher education.

The Deputy Minister of Education and Science, Youth and Sports of Ukraine gives the seal "Recommended by MONMSU" to textbooks on disciplines provided for by the higher education institution component of state standards of higher education, dictionaries, and reference books.

Manuscripts to which vultures have been assigned are included in the publishing plans.

While performing research work, students draw up abstracts, course (diploma) theses, presentations at seminars, conferences, scientific articles; researchers, specialists prepare information, dissertations, reports, analytical notes, etc.

Scientific results- this is new knowledge obtained in the process of performing scientific research work. They must meet such requirements as:

- relevance for the current period of development of science and practice;
- novelty: obtained for the first time, developed, developed;
- practical significance, use in the professional work of a specialist;
- reliability, that is, the correctness of the use of mathematical models, formulas;
- accuracy of calculations;
- repeatability during the experiment;
- unambiguous formations.

Scientific results must pass approval, be published in special scientific literature, have appropriate reviews.

In the process of approbation for the purpose of informing about the results of the performed scientific research, developing recommendations for further work, their use in the educational process or in the conditions of production, the discussion of the problem is organized at the department, at a seminar, symposia of specialists, scientific and practical conferences (Fig. 2).

Fig. 2. Forms of reporting and implementation of research results

Research informationis a document containing research results without their interpretation (explanation of numerical data):

- concise statement of the problem situation;
- a list of goals and tasks of the GDR;
- description of socio-demographic characteristics of the sample population;
- distribution of answers to questionnaires or interviews and results of document analysis in the form of tables.

Information noteabout research is small in scope, has the same requirements as information, but the results of research activities with specific conclusions are commented in more detail.

Analytical noteabout research can complete significant stages of research or be the main final document of small research works. It has a larger volume and the following structure:

1. Introduction;
2) the main part;
3) the final part.

The introduction justifies the necessity of the conducted research, the use of certain methods of information collection, processing and analysis; the purpose, tasks are described, the characteristics of the research technique are given.

The main part includes the analysis of the achieved research results, processing and systematization of quantitative and qualitative concepts, establishing regularities.

The final part presents the main conclusions and ways of solving the identified problems, recommendations for practical application. When conducting fundamental scientific research, the main final document is the report on the GDR. It contains the following mandatory elements:

- title page;
- list of performers;
- content;
- a list of conventional designations and symbols;
- introduction;
- the main part;
- the final part;
- References;
- appendices (tables, diagrams).

When performing and drawing up a report on the conducted research work, it is necessary to comply with the general requirements stipulated by the state standard for the corresponding type of work.

The volume of the report does not exceed 90-100 pages of one volume, and there should be several volumes. When drawing up a report, the following requirements should be observed: clarity, logic, concreteness of presentation, argumentation of conclusions, accuracy of wording, reasonableness of recommendations and suggestions.

A significant part of scientific information and reports is used to improve process management, increase the efficiency of enterprises, organizations and institutions.

Such a form of implementation as reports, speeches, lectures at scientific and

practical events is widely used.

Conference- is a form of collective contacts of scientists and specialists of the same scientific direction.

Colloquium- this is a form of collective meetings, where, as a rule, there is an exchange of opinions of scientists of various directions, that is, it is a form of casual discussion, but where there are official speakers.

Symposium- this is a semi-formal conversation based on pre-prepared reports, as well as impromptu speeches. It can also be conversations on the sidelines.

Conference- the most common form of information exchange on a certain topic. One part of the speakers communicates certain scientific ideas, research results, work experience, the other part - most of them are listeners, perceive information, participate in the discussion. Here, speakers and listeners have a large informational load, therefore regulations are established in speeches and discussions, sectional work is organized. At the conferences, poster information, a literature exhibition, samples of materials can be used, the thematic expositions of the conference are drawn up, decisions and recommendations are usually made.

Conventions, congresses, exhibitions, fairs, festivalsis the highest and representative form of communication, they are national or international in nature. Here, the strategy of a certain field of science and economy is worked out, the experience and scientific achievements of specialists are exchanged, and the coordination of scientific research is ensured in the wide and spacious boundaries of the world community.

Being able to work with a book means quickly understanding its structure, correctly evaluating and recording in a convenient form everything that seems interesting and necessary for carrying out scientific research.

It is believed that the study of literature on the chosen topic should begin with general works in order to have an idea about the main issues close to the research topic, and then conduct a search for new editions of special literature.

At the first stage, you should cover as many sources as possible, and then gradually "screen out" unnecessary publications. However, a more productive method is to deliberately limit the range of sources from the very beginning of the work, and the study begins with those that are directly related to the topic of scientific research. As experience shows, an excessive range of sources of information slows down the solution of a specific scientific problem for a long time.

One's own organization of work is especially important, which should correspond to the main idea of scientific organization of work - maximum effect with minimal time consumption. This means that in any work it is necessary to develop such methods that would allow the same amount of work to be performed in a shorter period of time. It is equally important for a student and a scientific researcher to learn how to use their time budget rationally.

As a recommendation, you can focus on the following: before starting work, you need to focus on the subject of study. To do this, it is suggested to distract yourself from all current worries and switch to the content and purpose of the work being performed. Keeping your workplace in order helps you focus.

After that, it is necessary to immediately pay attention to the intense load, the

habit of long swinging at the beginning of work is harmful.

During the class, it is recommended to resolutely reject all side thoughts and associations, think only about work. At the same time, favorable conditions for focusing attention are gradually created. An intensively working person does not react to extraneous stimuli.

In pedagogical psychology, pedagogy and methodology, numerous specific scientific recommendations aimed at improving the organization of mental work have been developed. From a methodological point of view, it is primarily about the organization of perception, processing and assimilation of knowledge.

The process of acquiring knowledge begins with their perception (reading, listening, direct observation of facts).

First, the purpose of the work is clarified. To read or listen "just like that", aimlessly - means wasting time.

At the beginning of the work, you need to familiarize yourself with the selected sources. The method of reading scientific literature is somewhat different from fiction. There is "fast" and "slow" reading: a cursory review of the book's content or thorough study. A cursory review of the contents gives an opportunity to get acquainted with the book in general terms, when it becomes clear to the researcher that this book contains the necessary information and needs to be carefully processed, or to get only a general idea. That is, cursory viewing is essentially "search reading".

The text should not only be read, but also studied with a pencil in hand, with certain notes. If you have your own copy or photocopy of a magazine or book, you can make marks in the margins.

A clear orientation of the researcher to the topic of the problem and its main questions (chapters and subsections) will help speed up the purposeful selection and study of the literature. Of course, reading is the stimulation of ideas. A careful reading of any text should give rise to certain thoughts, hypotheses that correspond to one's own view of things.

The stages of studying scientific sources of information can be divided into:

- general familiarization with solving a scientific problem;
- a cursory review of the selected literature and its systematization in accordance with the content of the work and the sequence of study and processing;
- reading according to the sequence of placing the material;
- selective reading of individual parts;
- prescribing the necessary material for forming the text of a research paper;
- critical evaluation of the recorded, editing and final recording as a fragment of the text of a scientific work (article, monograph, course (diploma) work, dissertation, etc.).

A slightly different method of processing literary sources is possible. A sheet of paper is divided in half by a vertical line. On the left side, they write down the content of what they read, and on the right side - their comments, highlighting particularly significant definitions and formulations. It is necessary to specify not only the bibliographic description of the sources, but also the codes of the subject headings that correspond to the section of the scientific work, it is no coincidence that it is always said about the need to read "with a pencil in hand". Keeping records when

reading literature is mandatory, it contributes to better assimilation of what is read. The main thing is to record an idea about this source of information and, if possible, predict the future need for the data contained in the book and, within reasonable limits, take from it everything that may be needed in further work.

There are practical techniques aimed at ensuring that records take the least time in the reading process and that they can be easily used later. If the book is personal, then entries can be made directly in the margins, while having its own system of conventional markings.

Three groups of signs are usually used:

- signs of approval of individual expressions in the text (underlining, exclamation marks);

- signs of misunderstanding, denial - wavy underlining, question marks, words: for what? as? where is it from or a link to another page of text?

- additional signs - for recording additional information, suggestions of the reader (dotted line, entries of the type: "see also").

If the book belongs to someone else or belongs to the library, making any marks in it is a sign of lack of culture. Here you need to use entries in workbooks, and preferably on separate sheets or cards.

Usually, only the most essential for a given book or article and that which arouses a certain professional interest and personal interest are written out. In order to avoid repetitions, recordings should be made after an introductory "quick" reading.

When quickly reading a book, you can make paper screensavers in those places that seem particularly interesting at first glance.

Entries in the course of reading should be user-friendly and qualified. Consider I. Pavlov's statement on this matter: "Learn to do rough work in science. Study, compare, accumulate facts. No matter how perfect a bird's wing was, it could never lift it up without air resistance. Facts are the air of a scientist. Without them, you will not be able to fly. Without them, your "theories" are empty efforts.

In working with sources, accumulating facts in order to save time, one should strive for brevity, using various types of abbreviations. The record reduction system can be individual, thought out in advance, based on generally accepted rules. It can be only the beginning of a word (audience - aud.), throwing out the middle part (publishing house - in-vo, management - men-t), introducing a slash in the abbreviation of word combinations (s/arif - arithmetic mean), etc. Experience shows that the recording speed can be much higher - 40-70 words per minute.

The use of conventional signs - symbols, < > greater than, less than, = is equal to, S - standard, also gives a great saving of time.

The arrangement of records helps to understand the logical connections between individual concepts, their hierarchy, selection of headings, key words, segmentation of the text, underlining, numbering, different colors, etc.

Card-based recording has great advantages, when each recording is made on a separate card made of strong paper or cardboard. Each such card is used for records on one question, considered as a unit that has its place in scientific work. You can easily organize the cards in any order, make insertions in the text of the manuscript.

A practical recommendation is to keep records on only one side of the sheet. At

the same time, the search and systematization is accelerated, it makes it possible to make any insertions in the text, to use records in the preparation of reports, scientific articles, etc.

When to record? It is impossible to give an unequivocal answer here, but it is better to make notes when re-reading the literature.

In the process of processing sources, only scientific facts should be selected.

Scientific fact- is an element that is the basis of scientific knowledge, reflects the objective properties of processes and phenomena: novelty, accuracy and objectivity and reliability. It is necessary to select the most authoritative sources containing the latest data, to indicate exactly where the material is taken from.

Quotations are a special form of factual material - this is a verbatim excerpt of a work, someone's saying, which organically fit into the text of a scientific work as a confirmation or denial of a certain opinion. Special diligence is required here, because any carelessness in extracting data results in the loss of additional time to clarify the author's opinion. It often happens that individual thoughts are conveyed in their own words without quoting verbatim.

Based on their content, the author performs analysis and synthesis, builds a system of substantiated evidence.

Quotations are also used to confirm individual judgments expressed by the researcher. The following rules should be followed when citing sources:

- the text of the quotation begins and ends with quotation marks and is given in the grammatical form in which it is presented in the source, preserving the features of the author's writing. Scientific terms proposed by other authors are not highlighted with quotation marks, except for those that have caused general controversy. In these cases, the expression "so-called" is used;
- the citation must be complete, without arbitrarily shortening the author's text and without distorting the author's thoughts. Omission of words, sentences, paragraphs when quoting is allowed and is marked with three dots. They are placed anywhere in the quote (at the beginning, inside, at the end). If there was a punctuation mark before or after the released text, it is not saved;
- each quote must be accompanied by a reference to the source, a serial number is given according to the list of literary sources, highlighted in square brackets;
- in the case of indirect quoting (representation of opinion), which gives a significant saving of the text, one should be extremely precise in expressing the author's opinions, be specific in evaluating his results and give appropriate references to the source;
- citations should organically "fit" into the context of the scientific work.

Reviewing the literature on the issues is a rather difficult task when performing scientific research. In order to avoid primitiveness and mistakes in the analysis of literature, the views of scientists should be carefully systematized in the following order:

- the essence of this phenomenon, process (the position of several authors coincides in this or that aspect);
- what constitutes the content of this process or phenomenon (its components, chains, stages, stages of development);

- views of scientists regarding ways to solve this problem in practice (who and what is proposed);

- what difficulties, identified in previous studies, occur in practice;

- what factors, conditions for the effective development of the process or phenomenon in this field have been identified by scientists.

The review of sources makes it possible to determine a new direction of scientific research, its importance for the development of science and practice, and the relevance of the topic.

A review of literary sources makes it possible to reveal the professional competence of the researcher, his personal contribution to the development of the topic compared to already known studies. The study of literature is not carried out to borrow material, but to think over the information found and develop one's own concept, which can become an independent publication of the author.

At the end of each paper, after the conclusions, a list of used sources is provided. Information about the sources included in the list must be submitted in accordance with the requirements of the state standard. Examples of bibliographic description in the "List of used sources":

1. **Laws of Ukraine.**

About information: Law of Ukraine dated 02.10.92 No. 2567 // Bulletin of the Verkhovna Rada of Ukraine. - 1992. - No. 48. - Art. 650.

2. **Decrees of the President of Ukraine.**

On state support of small entrepreneurship: Decree of the President of Ukraine dated October 19, 2000 No. 2063-111 // Voice of Ukraine. - 2000. - October 20 - P. 2-3.

3. **Resolutions of the Cabinet of Ministers of Ukraine.**

On the approval of a standard regulation on the attestation of local self-government officials: Resolution of the Cabinet of Ministers of Ukraine dated October 26, 2001 No. 1440 // Government courier. - 2001. - October 28 - P. 2.

4. **Normative documents of ministries and departments.**

Regulations on documentary support of records in accounting: Approval. by order of the Ministry of Finance of Ukraine dated May 24, 1995 No. 88 // Accounting and auditing. - 1995. - No. 9. - P. 11-12.

5. **Standards.**

State classifier of management documentation: DK 010-98. - Valid from December 31, 1998. - K.: Derzhstandard of Ukraine, 1999. - 80 p.

DSTU 3137-95. Foreign economic activity. Terms and definitions of basic concepts: Ed. officer - K.: Derzhstandard of Ukraine, 1996. - 30 p.

6. **Monographs (one, two or three authors).**

Ignatenko M. A. The reader as a participant in the literary process: Monograph. - K.: Naukova dumka, 1980. - 171 p.

Bandurka O. M., Dzyuba N. V. The original origin of capital in the economy of Ukraine: Monograph. - Kh.: NUVS, 2003. - 196 p.

Dudyuk D. L., Maksimov V. M., Orikhovsky R. Ya. Electrical measurements: Teaching. manual - Lviv: Afisha, 2003. - 206 p.

Davis H. Social Justice and the City. - New York, 1996. - 336 p.

7. **Monographs (four authors).**

Lithogenesis of Devonian sediments of the Pridobruzh depression: paleo-oceanography, sedimentary cyclicity of the formation of reservoir rocks: Monograph / V. P. Hnidec, K. G. Grigorchuk, B. M. Polukhtovych, V. O. Fedyshin. - K.: UkrDGRU, 2003. - 96 p.

8. **Monographs (five or more authors).**

Pediatrics: Education. manual / S. K. Tkachenko, R. I. Potsyurko, Yu. S. Korzhynskyi and others. - K.: Zdorovya, 2003. - 752 p.

9. **Multi-volume editions.**

Ostap Vyshnya: Works in four volumes. - K.: Dnipro, 1988. - Vol. 1. - 526 p.

10. **Translation publications.**

Ferraro B. Circles on the water: Short stories for the soul / Trans. with gender H. Teodorovych. - Lviv: Svichado, 2003. - 72 p.

11. **Collections of scientific papers.**

Computational and applied mathematics: Collection. of science pr. - K.: Lybid, 1993. - 99 p.

12. **Dictionaries.**

Russian-Ukrainian dictionary of railway terms / Incl. L. P. Vatulya, V. S. Fomenko; Under the editorship Yu. V. Sobolev. - K.: Transport of Ukraine, 2000. - 483 p.

13. **Deposited scientific works.**

Melikov A. Z., Konstantinov S. N. Overview of analytical methods and optimization of multi-resource service systems / Nauch.-proizv. Corporation "Kyiv. Institute of Automation". - K., 1996. - 44 p. - Rus. - Dept. in the National Security Service of Ukraine 11.11.96, No. 2210 - Uk96. - Ref. in: Automation of production processes. – 1996. – No. 2.

14. **Components of the book.**

Gerasimenko V. Ya. Yuriy Fedkovich // History of Ukrainian literature. - K.: Naukova Dumka, 1968. - Vol. 3. - P. 315-349.

15. **Components of the collection.**

Tsekov Yu. I. Subtext of a work of art and the writer's self-perception // Problems of modern literary science. - Odesa: TsUL, 1998. - P. 149-180.

16. **Constituent parts of the magazine.**

Dzyuba I. M. Ukraine before the sphinx of the future // Scientific world. - 2004. - No. 2. - P. 2-6.

17. **Components of a foreign magazine.**

Perez K. Radiation therapy for cancer of the cervix // Oncology. - 1993. - Vol. 7, No. 2. - P. 89-96.

18. **Components of the encyclopedia.**

Kosyachenko V. T. Anekdot // Ukrainian literary encyclopedia. - K.: Main editor. URE named after M. P. Bazhana, 1998. - P. 67.

19. **Abstracts of reports.**

Palikhata E. Peculiarities of dialogic speech in the works of Stepan Rudansky //

Satire and humor in the Ukrainian literary tradition: Materials of the All-Ukrainian scientific conference (May 11–12, 1994). – Chernivtsi: Chernivtsi state. University named after Yurii Fedkovycha, 1994. - P. 265-267.

20. **Dissertations.**

A. Z. Korolko. Public-political and scientific activity of Anton Petrushevich: Diss. ... candidate history Sciences: 07.00.01. - K.: KNTEU, 2001. - 185 p.

21. **Dissertation abstracts.**

Solovei E. S. Ukrainian Philosophical Lyrics: Tradition. Topology. Poetics: Autoref. thesis ... Dr. Philol. Sciences: 10.01.08 / Inst. l-ry named after T. G. Shevchenko, Academy of Sciences of Ukraine. - K., 1992. - 40 p.

22. **Archives.**

Letter of O. P. Dovzhenka to his mother. April 13, 1947 - Central Committee of Ukraine. – F. 235. – Op. 2. – Unit. coll. 5. – P. 6-7.

23. **Preprints.**

Ponomarenko L. A., Buadze V. V. Mathematical models and algorithms for collecting and processing information in the automatic control system of continuous hot rolling mills / K., 1976. – 37 p. (Prepr. / Academy of Sciences of Ukraine. Institute of Cybernetics; 76-76).

24. **Reviews (as a separate article).**

Matsko V. Fresh thought, creative search // Future. – Khmelnytskyi, 1997. – No. 6. – P. 3. – Rec. in the book: Romaniuk M. M. The Ukrainian press of Northern Bukovyna (1918–1940). - Lviv: Fenix, 1996. - 196 p.

25. **TV and radio broadcasts.**

Youth is the future of Ukraine: [Speeches during the telethon] // Archive of Lviv. region TV. - 2001. - June 1.

26. **Electronic data carriers.**

Note to the hacker // <www.miss.gov.ua>. - 2009.

The bibliographic description is compiled in accordance with the current standards of library and publishing business (in particular: DSTU GOST 7.1.2006. Bibliographic entry. Bibliographic description. General requirements and rules of compilation; DSTU 3582-97. Information and documentation. Abbreviations of words in the Ukrainian language in the bibliographic description . General requirements and rules).

The bibliographic description is made directly according to the printed work or written out from the catalogs and bibliographic indexes completely without omission of any elements, abbreviations of names, etc. Compliance by the authors with the requirements of current standards is mandatory.

The list of used sources is an element of the bibliographic apparatus, reflects the independent creative work of the author and indicates the level of the conducted research.

Materials for self-control:

AND. Questions for self-control:

B. Test tasks and problems

Summing up.

List of recommended literature

Main:

1. Gutorov O.I. Methodology and organization of scientific research: study guide. Kharkiv: KHNAU, 2017. 272 p.
2. Danilyan O.G., Dzoban O.P. Organization and methodology of scientific research: teaching. manual Kharkiv: Pravo, 2017. 448 p.
3. Degtyarev A.V., Kokodiy M.G., Maslov V.O. Fundamentals of scientific research: a study guide. Kharkiv: KHNU named after V. N. Karazina, 2016. 78 p.
4. Kostyukevich V.M., Konnova M.V. Methodology of scientific research: study guide. Vinnitsa. 2017. Vol. 172.
5. Malyhina V.D. Methodology of scientific research. Rivne. 2016. 247 p.
6. Methodology of scientific research: teaching manual. / V.I. Zatserkovnyi, I.V. Tishaev, V.K. Demidov – Nizhyn: NSU named after M. Gogol, 2017. – 236 p.
7. Methodology of scientific research in medicine: teaching. manual / V.D. Babajan, N.S. Bakumenko, O.I. Kadykova and others; under the editorship P.G. Kravchuna, V.D. Babajana, V.V. Meat eater. – Kharkiv: KhNMU, 2020. – 260 p.

Additional:

1. Puzanova O. G. Information provision of evidence-based health care. Part I. / O. G. Puzanova, T. S. Gruzheva // Proof. honey. – 2014. – No. 4 (16). - P. 23-33.
2. Skakun M. P. Fundamentals of evidence-based medicine: monograph / M. P. Skakun. - Ternopil: Ukrmedknyga, 2005. - 244 p.
3. Chernobrovy V. M. Health, pre-disease, disease: medical and social aspects and assessment. Risk factors. Preventive medicine: a guide for graduate students, interns, general practitioners - family medicine / V. M. Chernobrovyi, S. G. Melashchenko, T. M. Tkachuk. – Vinnytsia: Planer, 2013. – 80 p.
4. Shulyak V. I. International experience of using an integrated clinical protocol in medical practice (literature review) / V. I. Shulyak // Ukr. honey. magazine – 2010. – No. 5 (79). - P. 41-44.
5. Howick J. The Philosophy of Evidence-Based Medicine / J. Howick. - Oxford: Blackwell-Wiley, 2011. - 238p.

Electronic information resources:

1. Best Evidence. URL: http://www.bestevidence.com/
2. BritishMedicalJournal. url http://www.bmj.com/specialties/evidence-based-practice
3. CanadianMedicalAssociation. URL: http://www.cma.ca/
4. Center for Evidence-based Medicine at the University of Oxford. URL: http://www.cebm.net/
5. Clinical Evidence. URL: http://clinicalevidence.bmj.com/x/index.html

6. Cochrane Collaboration open learning material for reviewers. URL: http://www.cochrane-net.org/openlearning
7. Cochrane Library. URL: http://www.thecochranelibrary.com/
8. Current Controlled Trials. URL: http://www.controlled-trials.com/mrct
9. eGuidelines. URL: http://www.eguidelines.co.uk/
10. Evidence-Based Medicine. URL: http://ebm.bmj.com/
11. Canada Clinical Guidelines Database. URL: http://www.phac-aspc.gc.ca/
12. JAMAEvidence. URL: http://www.jamaevidence.com/
13. Medscape. URL: http://www.medscape.com/
14. National Institute for Clinical Excellence. URL: http://www.nice.org.uk/
15. PRODIGY (Clinical Guidance). URL: http://prodigy.clarity.co.uk/

Practical lesson No. 6

SUBJECT: "Implementation of scientific research and its effectiveness in medicine." - 2 hours

Goal: The process of implementing scientific research and its stages. Effectiveness of scientific research. The main types of effectiveness of scientific research in medicine. Evaluation of research effectiveness.

Basic concepts:

Term	Definition
Implementation	— is the transfer of scientific products (research results, methods, instructions, report) to the customer of the GDR in a form convenient for implementation, which ensures a technical and economic effect.
Scientific effect	is an increase in the quantity and quality of information or the amount of knowledge in a certain field of science.
Scientific and technical effect	is an increase in scientific and technical information that can be aimed at creating new products or new technology.

Actuality of theme

The purpose of the concept of the implementation of scientific research is to determine the strategic priority directions for the development of scientific, scientific and technical and innovative components of medical academic science for the coming years, to create conditions for increasing the effectiveness of scientific research and using their results to ensure the development of all spheres of social life, to introduce functioning mechanisms with integration a combination of modern forms of the scientific process, training of high-level scientists, implementation of innovative activities and development of the medical field, built on modern fundamental and applied knowledge.

Plan

I. Organizational moment (greetings, checking those present, announcing the topic, the purpose of the lesson, motivating students to study the topic).
II. Control of basic knowledge: Theoretical questions for the lesson:

III. Formation of professional skills and abilities. Practical works (tasks) performed in class:

- Research implementation;
- The main results of scientific research;
- Criteria for the effectiveness of scientific research.

Topic content:

Basics of the practice of implementing the results of scientific research

The results of scientific research are largely determined by the degree of their implementation, that is, the implementation of the results in practice. Implementation of completed scientific research is the final stage of the GDR.

Implementation- this is the transfer of scientific products (research results, methods, instructions, report) to the customer of the GDR in a form convenient for implementation, which ensures a technical and economic effect.

It should be noted that the GDR turns into a real product only from the moment of consumption of scientific research work by the customer. Therefore, the implementation of completed scientific research consists in transferring it to practical use.

The main results of scientific research are as follows:

- confirmation of theoretical regularities by the results of the experiment;
- development of new methods and techniques used in research;
- application of developed methods, techniques, algorithms, etc. in the process of exchange, control, analysis, assessment, management organization of the industry, enterprise, etc.;
- application of research results in the educational process.

The implementation of the results of the NDR is financed by the organizations that implement it.

Science and its problem

Science is the most effective area of capital investment. It is known in world practice that the profit from capital investments in science is much greater than the profit in other areas of the economy. According to foreign specialists, for one dollar spent on science, the annual profit is 4-7 dollars or more. In Ukraine for 1 hryvnia. the cost of science, the profit reaches 3-8 hryvnias.

However, the effectiveness of scientific research can be judged only after their successful implementation in production, when they begin to give a return to the national economy. The time factor plays a big role here. The best term is up to 3 years. For most scientific research, the probability of obtaining an economic effect exceeds 80%. The result of scientific research (research work, GDR) is the achievement of scientific, scientific-technical, economic, financial-economic, social and environmental effects.

*Scientific effect*characterized by an increase in the amount and quality of information or the amount of knowledge in a certain field of science.

*Scientific and technical effect*associated with the growth of scientific and technical information, which can be aimed at creating new products or new technology.

*Economic effect*reflects the excess of revenues from the implementation of the results of the NDR compared to the previous technology.

*Financial and economic effect*together with the economic effect implies a significant final improvement in the financial condition of the enterprise or firm.

*Social effect*reflects the improvement of people's quality of life, which adequately manifests itself in the growth of workers' incomes, ensuring their employment, improving working conditions, reducing injuries, etc.

*Ecological effect*means the reduction of anthropogenic impact on the environment as a result of the implementation of the GDR.

The criteria for the effectiveness of scientific research are as follows:

- scientific significance of the work performed;

- the volume of scientific production, which is measured by the total or average number of publications per researcher, completed and defended dissertations, etc.;
- saving public expenses.

The criteria for the effectiveness of the scientific work of scientific workers are as follows: the total number of printed publications, the number of monographs, textbooks, training manuals; labor productivity index in thousand hryvnias; the novelty of developments, the number of copyrights and patents, etc.

According to such criteria, the work of scientists can be standardized, that is, their work, work efficiency, and salary. However, accurately evaluating the effectiveness of scientific research is a very difficult matter, especially with regard to quantitative evaluations. After all, any GDR should be considered from different points of view, assessing their scientific-cognitive, social, technical-economic, pedagogical and educational significance.

Criteria for the scientist's work productivity and evaluation of the economic efficiency of scientific research

The criteria of a scientist's work productivity can be determined by various indicators: the number of publications, the number of patents, the number of defended dissertations, etc., but also by the formula:

Kn,= $\frac{Co}{P}$

where: Kn - the criterion of the scientist's labor productivity;
Co - the total estimated cost of the GDR, in which the scientist participated;
P - the average number of employees who participated in the implementation of the NDR.

The economic efficiency of scientific research is calculated according to the formula: Ke=$\frac{E}{B}$,

where: Ke - coefficient of economic efficiency;
E - economic effect from the implementation of scientific research;
B - costs for the implementation and implementation of the NDR.

However, the criterion of economic efficiency Ke does not take into account the volume of products when implementing the NDR in production, the period of implementation, and therefore the criterion of economic efficiency, which is calculated according to the formula, is more effective:

Ke= ,$\frac{Cp*T}{3o}$

where: Ke - the cost of products for the year produced after implementation;
SR*T - duration of production implementation in years;
ZO - general expenses for the implementation of scientific and research work.

Even this criterion is not enough when evaluating large research works. In such cases, the examination of scientific topics is carried out by specially selected scientists who determine the prospects and effectiveness of scientific research.

The priority direction of activity of the scientific institutions of the National Academy of Sciences during all the years of existence was and remains the implementation of fundamental and applied scientific research in the field of medicine and the implementation of the obtained results in the practical activities of

health care institutions of Ukraine.

The creation and transfer of new methods, methods and technologies for the diagnosis, treatment and prevention of the most common human diseases (including new medicines, medical equipment and medical products) is one of the most important components of the activity of the National Academy of Sciences for the implementation of the state's innovative policy in the field of protection health.

Today, improving the management of the results of scientific and scientific-technical activities is becoming an urgent prerequisite for the effective functioning of the medical industry. Such management should guarantee its sustainable development, the attraction of extrabudgetary funds and at the same time be flexible enough to constantly ensure the alignment of scientific goals with specific social needs and real funding opportunities. In accordance with the existing economic conditions, it should be important to make full use of world achievements with access to our own advanced concepts, theories, methodology and technology, which would ensure the avant-garde position of our medical science. It is necessary to choose the most important, promising and priority goals, taking into account the existing scientific, technical and socio-economic development.

It is necessary to significantly increase the competitiveness and export capabilities of Ukrainian medical science on the world market of scientific products and medical services. The main attention should be given to the development of fundamental knowledge and innovations in the medical field.

It should be noted that the "medical revolution" of recent years had a significant impact on the development of medical science in a number of science-intensive areas - primarily in molecular biology and modern biotechnologies, nanotechnologies, molecular genetics, and information technologies.

This contributed to a significant re-equipment of the methodological base of scientific research, rethinking of the ideology and scientific foundations of the problems of theoretical and clinical medicine. The analysis of world science research shows that the breakthrough directions at this stage are bioinformatics, systems biology, nanobiotechnologies, genomics, proteomics, and cellular technologies. Nuclear medicine, gravity, laser magnetic therapy, and electromagnetic hyperthermia are developing rapidly. Breakthroughs and discoveries in the field of quantum physics of cell functioning are possible. An increase in the volume of research in the field of creating new medicines is expected, which is especially important for a country that depends on the import of medicines.

All this can be realized with the development of scientific and technical entrepreneurship, through the creation of scientific production enterprises within the framework of academic institutes and higher medical educational institutions, the elimination of interdepartmental barriers, the strengthening of the integration of scientific topics, the rational use of budget funds, and the active implementation of results in the practice of health care.

A transition to a fundamentally new quality of scientific research and management of the activities of the National Academy of Sciences is necessary with the creation of a unified system of scientific information planning of research and implementation of the results of scientific research works, the organization of

effective interdepartmental cooperation and cooperation with representatives of other theoretical disciplines with an orientation towards the predominant development of preventive medicine. This will contribute to a significant re-equipment of the methodological base of scientific research, rethinking of the ideology and scientific foundations of the problems of theoretical and clinical medicine.

Materials for self-control:
AND. Questions for self-control:
B. Test tasks and problems

Summing up.

List of recommended literature

Main:

1. Gutorov O.I. Methodology and organization of scientific research: study guide. Kharkiv: KHNAU, 2017. 272 p.
2. Danilyan O.G., Dzoban O.P. Organization and methodology of scientific research: teaching. manual Kharkiv: Pravo, 2017. 448 p.
3. Degtyarev A.V., Kokodiy M.G., Maslov V.O. Fundamentals of scientific research: a study guide. Kharkiv: KHNU named after V. N. Karazina, 2016. 78 p.
4. Kostyukevich V.M., Konnova M.V. Methodology of scientific research: study guide. Vinnitsa. 2017. Vol. 172.
5. Malyhina V.D. Methodology of scientific research. Rivne. 2016. 247 p.
6. Methodology of scientific research: teaching manual. / V.I. Zatserkovnyi, I.V. Tishaev, V.K. Demidov – Nizhyn: NSU named after M. Gogol, 2017. – 236 p.
7. Methodology of scientific research in medicine: teaching. manual / V.D. Babajan, N.S. Bakumenko, O.I. Kadykova and others; under the editorship P.G. Kravchuna, V.D. Babajana, V.V. Meat eater. – Kharkiv: KhNMU, 2020. – 260 p.

Additional:

1. Puzanova O. G. Information provision of evidence-based health care. Part I. / O. G. Puzanova, T. S. Gruzheva // Proof. honey. – 2014. – No. 4 (16). - P. 23-33.
2. Skakun M. P. Fundamentals of evidence-based medicine: monograph / M. P. Skakun. - Ternopil: Ukrmedknyga, 2005. - 244 p.
3. Chernobrovy V. M. Health, pre-disease, disease: medical and social aspects and assessment. Risk factors. Preventive medicine: a guide for graduate students, interns, general practitioners - family medicine / V. M. Chernobrovyi, S. G. Melashchenko, T. M. Tkachuk. – Vinnytsia: Planer, 2013. – 80 p.
4. Shulyak V. I. International experience in the application of integrated clinicalprotocol in medical practice (literature review) / V. I. Shulyak // Ukr. honey. magazine – 2010. – No. 5 (79). - P. 41-44.
5. Howick J. The Philosophy of Evidence-Based Medicine / J. Howick. - Oxford: Blackwell-Wiley, 2011. - 238p.

Electronic information resources:

1. Best Evidence. URL: http://www.bestevidence.com/
2. BritishMedicalJournal. url http://www.bmj.com/specialties/evidence-based-practice
3. CanadianMedicalAssociation. URL: http://www.cma.ca/
4. Center for Evidence-based Medicine at the University of Oxford. URL: http://www.cebm.net/
5. Clinical Evidence. URL: http://clinicalevidence.bmj.com/x/index.html
6. Cochrane Collaboration open learning material for reviewers. URL: http://www.cochrane-net.org/openlearning
7. Cochrane Library. URL: http://www.thecochranelibrary.com/
8. Current Controlled Trials. URL: http://www.controlled-trials.com/mrct
9. eGuidelines. URL: http://www.eguidelines.co.uk/
10. Evidence-Based Medicine. URL: http://ebm.bmj.com/
11. Canada Clinical Guidelines Database. URL: http://www.phac-aspc.gc.ca/
12. JAMAEvidence. URL: http://www.jamaevidence.com/
13. Medscape. URL: http://www.medscape.com/
14. National Institute for Clinical Excellence. URL: http://www.nice.org.uk/
15. PRODIGY (Clinical Guidance). URL: http://prodigy.clarity.co.uk/

Practical lesson No. 7

SUBJECT: "Language requirements and design of student research papers" - 2 hours

Goal:familiarization of students with language requirements, organization of scientific research and design of student scientific papers.

Basic concepts:

Term	Definition
The purpose of scientific work	—— is the planned result that should be reflected in its conclusions. The purpose is related to the topic and the hypothesis. The purpose of the work is revealed in the tasks.
Task	—— these are steps, the implementation of which involves obtaining the final results, the implementation of which determines the content of the scientific work. Tasks are divided into theoretical and practical (applied).
Scientific research	- is a purposeful process of cognition, which is carried out with the aim of exposing the patterns of changes in objects depending on certain conditions of place and time of their functioning for their further use in practical activities.
Scientific result	- new knowledge acquired in the process of fundamental or applied scientific research and recorded on scientific information carriers.

Actuality of theme

Scientific and medical information is an important component of the work of a modern doctor - both its reading and writing. Therefore, a doctor must possess the skills of critical reading of scientific and medical literature, find useful information for use in practice. But also the attentive reader can and should see possible shortcomings regarding the methodology, organization of research, statistical processing of data or design of a scientific publication.

Plan

I. Organizational moment (greetings, checking those present, announcing the topic, the purpose of the lesson, motivating students to study the topic).

II. Control of basic knowledge: Theoretical questions for the lesson:

III. Formation of professional skills and abilities. Practical works (tasks) performed in class:

- Stages of scientific research;
- Preparation of student scientific works;
- The procedure for organizing scientific research work.

Topic content:

Language and style of scientific workas part of the written scientific language developed under the influence of the so-called academic etiquette, the essence of which is the interpretation of one's own and borrowed points of view in order to substantiate scientific truth. Certain traditions have already been established

in the communication between scientists both orally and in writing. However, one should not think that there is a collection of "written" rules of scientific language. We can talk only about some established features. The most characteristic feature of written scientific language is the formal and logical way of presenting the material. This is reflected in the entire system of language means. A scientific presentation consists mainly of reflections, the purpose of which is to prove the truths discovered as a result of researching the facts of reality. A scientific text is characterized by semantic completeness, integrity and coherence. The most important means of expressing logical connections here are special functional and syntactic means of communication that indicate the sequence of thought development (first, first of all, then, firstly, secondly, therefore, etc.), negation (however, in the meantime , but, while, nevertheless, by no means), causal relations (thus, therefore, thanks to this, according to this, as a result of this, moreover, to the same), the transition from one thought to another (before going to... , let's turn to... , consider, let's stop at... , having considered... , let's go to... , it is necessary to stop at... , it is necessary to consider...), the result, conclusion (so, as a conclusion, in conclusion, we note that everything that has been said makes it possible to draw a conclusion, summarizing, it should be said...).

Pronouns, adjectives and adverbs (given, that, such, named, indicated, etc.) can be used as means of logical communication. These and similar words do not always decorate the scientific work, but they are a kind of signposts that warn about the turns of the author's thought, inform about the peculiarities of his creative path. The reader of a scientific work immediately understands that the words "really" or "actually" indicate that the following text should be a proof, "on the other hand", "on the contrary", "but" prepare the reader for the perception of opposition, "because" - an explanation.

In some cases, word combinations of the type discussed above not only help to outline the transitions of the author's thought, but also contribute to the improvement of the rubrication of the text. For example, the words "let's move on to the review" can replace the title of the rubric. They, playing the role of unallocated rubrics, clarify the internal sequence of the presentation, and therefore are very necessary in a scientific text. At the level of the whole text, the main feature of scientific language is probably purposefulness and pragmatism. From this it becomes clear why emotional linguistic elements do not play a special role in scientific works. A scientific text is characterized by the fact that it consists only of accurate information and facts obtained as a result of long-term observations and scientific experiments. This determines the accuracy of their verbal expression and, thus, the use of special terminology. Thanks to special terms, it becomes possible to give detailed definitions and characteristics of scientific facts, concepts, processes, phenomena in a short and economical form. . Therefore, it is necessary to choose scientific terms and definitions very carefully. You cannot arbitrarily mix different terminology in one text, remembering that each branch of science has its own terminological system.

Professional vocabulary, that is, words and expressions common in a certain scientific environment, is also not used instead of the terms accepted in this science. Professionalism is not a designation of scientific concepts, but conditional, highly

differentiated names of realities that are used in the environment of narrow specialists and are understood only by them. This is their kind of jargon. Such jargon is based on a common understanding of a scientific concept.

The phraseology of scientific prose is also very specific. It is designed, on the one hand, to determine logical connections between parts of statements (such as, for example, stable connections, such as "provide results", "as the analysis showed", "on the basis of the data obtained", "summarizing what was said", "it follows from this , that", etc.), on the other hand, to denote certain concepts, being, in fact, terms (such as, for example, "active learning method", "author's method", "researcher's position", etc.). Let us now consider some peculiarities of the scientific language, which significantly affect the linguistic and stylistic design of the dissertation research. First of all, it should be noted the presence of a large number of nouns with an abstract meaning, as well as verbal nouns (research, consideration, study, etc.). In scientific prose, relative adjectives are widely represented, since it is they, unlike qualitative adjectives, that make it possible to indicate with extreme accuracy sufficient and necessary signs of concepts. As you know, it is not possible to form forms of degrees of comparison of relative adjectives. Therefore, in the scientific text, using qualitative adjectives, preference is given to analytical forms of the highest and highest degrees. To form the highest degree, the words "most", "least" are often used. The lack of expression is also a feature of the language of scientific prose. Hence, the dominant form of assessment is the ascertainment of features inherent in the word being defined. Therefore, most adjectives are here parts of terminological expressions. So, it would be correct to replace the adjective "following" with the pronoun "such", which everywhere emphasizes the sequence of listing features and signs. The verb and verb forms carry a special information load in the text of scientific works. Authors of scientific works usually write "the problem under consideration" and not "the problem under consideration". These verb forms serve to outline a permanent feature of the subject (in scientific laws, regularities established earlier or in the process of this research), they are also used when describing the course of research, proof, in describing the structure of technical objects.

Verbal forms of the imperfect past tense of the active mood are also widely used, because they do not fix the relation to the action being described at the time of utterance. Rarely - conditional verbs and almost never - imperative verbs. Reflexive verbs, passive constructions are often used, which is due to the need to emphasize the object of action, the subject of research (for example, "This article considers...", "It is planned to allocate additional hours...").

In the scientific language, the demonstrative pronouns "this", "that", "such" are very common. They not only specify the subject, but also determine the logical connections between the parts of the statement (for example, "These data serve as a sufficient basis for the conclusion..."). The pronouns "something", "something", "anything" are not used in the text of scientific works due to the imprecision of their meaning.

Let us now dwell on the syntax of scientific language. Since it is characterized by a logical sequence, there are separate sentences and parts of a complex syntactic whole, all components (simple and complex), as a rule, are very closely related to each other,

each subsequent one follows from the previous one or is the next link in the story or reasoning. Therefore, complex sentences of various types with clear syntactic connections are characteristic of a scientific text that requires complex argumentation and the identification of cause-and-effect relationships. Hence the variety of compound subordinating conjunctions "due to the fact that", "between the fact that", "because", "instead of", "in view of the fact that", "in view of the fact that", "due to the fact that , that", "after how", "while", etc. The derived prepositions "during", "according to...", "as a result", "in contrast to...", "next to...", "in connection with" etc. are especially often used.

In a scientific text, complex sentences are more common than complex sentences. This is explained by the fact that subordinating constructions reflect causal, temporal, consequential, conditional and similar relations, as well as by the fact that individual parts in a complex sentence are closely related to each other. The parts of a complex sentence are as if strung together, forming a kind of chain, the individual links of which are independent and can easily be rearranged. Impersonal, indefinite-personal sentences in a scientific text are used when describing facts, phenomena and processes. Nominative sentences are used in the names of sections, subsections and points, in captions under figures, diagrams, illustrations. Written scientific language also has purely stylistic features. The objectivity of the presentation is its main stylistic feature. Hence the presence in the text of scientific works of interjections and phrases to indicate the degree of credibility of the message. Thanks to such words, this or that fact can be presented as reliable (really, in fact, clear), plausible (you have to guess, as you can see), possible (perhaps, probably). A mandatory requirement for the objectivity of the presentation of the material is also an indication of the source of the message, the author of the expressed opinion, or some expression. ", "given", "in our opinion", etc.). The business and concrete nature of the description of the studied phenomena, facts and processes almost completely excludes emotionally colored words and exclamations. In the scientific language, certain standards for the presentation of the material have already been formed quite clearly. Thus, experiments are usually described using passive verbs. For example: "Received information about changes in motivation...", "Existing approaches were analyzed...". The use of similar syntactic constructions allows you to focus the reader's attention only on the action itself. At the same time, the subject of the action remains undefined, since it is not necessary to indicate it in this kind of scientific texts. The style of written scientific language is an impersonal monologue. Therefore, the presentation is usually conducted from the third person, because the attention is focused on the content and logical sequence of the message, and not on the subject. The forms of the first and second person singular pronouns are relatively rarely used and are not used at all. The author's "I" seems to recede into the background. Nowadays, it has become an unwritten rule in the scientific text to use "we" instead of "I", given that the expression of the subject of authorship as a formal collective gives greater objectivity to the presentation. Indeed, the expression of authorship through "we" makes it possible to reflect one's own opinion as the opinion of a certain group of people, scientific school or scientific direction. And this is quite understandable, since modern science is characterized by such trends as integration,

collective creativity,a comprehensive approach to solving problems. The pronoun "we" and its derivatives convey and shade these tendencies as best as possible. Having become a fact of scientific language, the pronoun "we" conditioned a whole series of new derivative phrases, for example: "in our opinion". However, the accumulation of the pronoun "we" in the text makes an unpleasant impression. Therefore, authors of scientific works (and, especially, dissertations) try to use inflections that exclude the presence of this pronoun. Constructions with indefinite personal sentences come to the rescue ("First, they analyze the results of control works, and then draw conclusions about the impact ..."). The form of presentation from the third person ("The author believes...") is also used. A similar function is performed by a sentence with passive participles ("A comprehensive approach to study was developed..."), in which there is no need to fix the subject of the action, which thereby makes it possible to avoid personal pronouns in the text of the dissertation. The qualities that define the culture of scientific language are accuracy, clarity and brevity. Semantic accuracy is one of the main conditions for ensuring the scientific and practical significance of the information contained in the text of the dissertation.

An inappropriately used word can significantly distort the meaning of what is written, lead to a double interpretation of this or that phrase, give the entire text an undesirable tonality

Unfortunately, the authors of scientific papers do not always achieve the correct use of words: choosing words carelessly, distorting the expressed opinion, making lexical errors, depriving the scientific language of accuracy and clarity. The accuracy of the scientific language is also ensured by the observance of stylistic norms and word connections in the sentence. Violation of them leads to misinterpretation of the expressed opinion. Yes, the construction is ambiguous: "There are no other aspirations with similar motives" (there are no other aspirations or similar motives - it is difficult to understand). Another necessary quality of scientific language is its clarity. Clarity is the ability to write accessible and profitable. Practice shows that especially many ambiguities arise where authors use words and phrases with an uncertain or too generalized meaning instead of exact quantitative values. In fact, can the reader of a scientific text who wants to see specific and accurate data in every line of its text be satisfied by the following phrases: "The necessary information for teachers who are interested in it is provided by periodicals and individual information in the mass media." "To ensure the normal course of the educational process, it is necessary that appropriate training of pedagogical workers who are interested in this be carried out beforehand."

Very often, dissertation authors write "etc.", not knowing how to continue the list, or enter the phrase "quite obvious" into the text when they cannot present other arguments. The phrases "known way" or "special device" often indicate that the author in the first case does not know how, and in the second - what device.

In most cases, the violation of the clarity of the presentation is caused by the efforts of individual authors to give their work an imaginary science. Hence the completely unnecessary scientism, when simple, well-known subjects are given complicated names. Yes, you can read:

"The new idea found full support in the educational environment." And why not say about the support of the idea more concretely and clearly: by teachers, scientific and pedagogical workers.

The reason for the unclearness of the statement may be the incorrect arrangement of words in the sentence. For example: "Four similar institutions serve several thousand people." Here, the subject does not differ in form from the direct application, and therefore it is unclear who (or what) is the subject of the action: people or institutions that serve them. Availability and profitability are often called simplicity. The simplicity of the presentation contributes to the fact that the text of the dissertation is easy to read, that is, when the author's thoughts are perceived without complications. However, simplicity and primitiveness cannot be equated. Simplicity should also not be confused with the general availability of scientific language. Popularization here is justified only in those cases when the scientific work is intended for a mass reader. The main thing in the linguistic and stylistic design of the text of the dissertation is that its content in the form of its presentation is accessible to the circle of scientists for whom this work is intended. Conciseness is the third necessary and mandatory quality of scientific language. The realization of this quality means the ability to avoid unnecessary repetitions, excessive detail and verbal junk. Every word and expression serves the purpose here, which can be formulated as follows: to convey the essence of the matter as concisely as possible. Therefore, words and phrases that do not carry any semantic load should be completely excluded from the scientific text. Verbosity or linguistic redundancy is most often manifested in the use of extra words. For example: "For this purpose, the teacher uses the available visualization tools" (if there are no tools, then they cannot be used); "The inspection established that the existing standards for providing students with educational literature in many educational institutions were significantly underestimated" (standards that do not exist cannot be either overstated or understated). To avoid verbosity, it is necessary first of all to fight against pleonasms, when unnecessary words creep into the text. They testify not only to the language carelessness of its author, but also often indicate his vague idea of the subject of research or the fact that he simply does not understand the exact meaning of words taken from a foreign language. This is how combinations such as: "break interval", "inner interior" and others appear.

Linguistic redundancy should also include the unnecessary use of foreign words that duplicate Ukrainian ones and thereby unnecessarily complicate the expression. Why, for example, say "nothing extraordinary" when you can say "nothing special"; instead of ordinary - ordinary, indifferent - do not care, ignore - do not notice, limit - limit, approximate - approximately, function - act, diversification - variety, determine - determine, approbation - check, creative - creative approach. Therefore, language requirements are necessary for writing student research papers.

Familiarize yourself with the types of scientific publications, learn the basic requirements for writing scientific articles and theses of scientific works.

Learn the peculiarities of the design of scientific works (presentation of data in tables, graphic images). Learn the basic techniques of writing a review of a scientific paper.

PROCEDURE FOR PERFORMING SCIENTIFIC AND RESEARCH

WORKS Preparation for the performance of work:

For the successful implementation of scientific research work, it is necessary to draw up a plan of scientific research, the main stages of which are:

The first stage- preparation for carrying out scientific research work: -

- selection of areas of research work;
- formulation of the topic of the work; justification of relevance;
- understanding of the research problem; - determination of the purpose and tasks of the work;
- definition of methods of scientific research; - drawing up a work plan.

The second stage- performance of scientific and research work: a) theoretical part:

- selection of actual material on the research topic; - compiling a bibliography;
- analysis of collected scientific material; b) practical part:

-conducting research, experiments (chemistry, biology), development of structures (scientific and technical disciplines); reports;

- processing and evaluation of research results;
- making decisions and recommendations regarding the obtained results;

-writing and design of the work manuscript, draft text, theses, etc

- design of visual material;
- preparation and adjustment of layouts, models, devices, etc. for demonstration.

The third stage isprotection of research work:

- protection of research work.

The following components should be defined in the research work:

- the topic of the research, which reflects the main content of the scientific work and determines its final result;
- the topicality of the topic is substantiated by analysis and comparison with the acquired knowledge on the specified problem, the essence of the problems obtained for the relevant field of science is revealed;

-a goal aimed at achieving the final result of the work;

- the tasks of the research arise from the purpose of the work and are determined taking into account the degree of study of the object, development of a scientific problem;
- the scientific novelty of the work must be related to its heuristics, that is, the possibility of obtaining new results and scientific data on its basis;
- research methods indicate how to solve the set tasks for each point of its plan;
- the essence of the research is to establish the general and individual characteristics of the object;

-research results – summarizing the obtained research results and establishing the main regular phenomena under study, including new ones;

- conclusions and recommendations - conclusions include the main results of the conducted research, and recommendations demonstrate ways, methods and forms of their practical use.

Scientific research is conducted under the guidance of teachers. It is advisable to carry out scientific work in the following sequence: choosing a topic, determining the goal and tasks of the research, developing a working hypothesis and clarifying the

object and subject of the research, identifying and selecting literature on the topic, studying it, drawing up a research plan, establishing an analysis of the material, performing experimental part of the work, characterization of research results, justification and formulation of conclusions and recommendations, design of research results for defense. Then the literary and technical design of the work, preparation for the defense and defense of the scientific work are carried out.

Writing the theoretical part of a scientific work

One of the most important stages of writing a research paper is choosing a topic and formulating it. The choice of the research topic is usually determined by the personal preferences and interests of the young scientist. The final definition and design of the topic is agreed with the supervisor.

It is important that the student (pupil) understands that the formulation of the chosen topic is not final. In the course of writing scientific and research work it can be adjusted.

Considerable attention should be paid to the wording of the title of the scientific work. The name should be clear, correspond to the chosen direction of research, indicate its purpose and completeness.

The next step is the processing of scientific sources on the topic of research, which involves familiarization with scientific literature and other sources to get an idea of the state of study of the problem. The use of different sources increases the reliability of the obtained results. For all research, it is important that the source exactly corresponds to the tasks and correlates with the topic of the scientific work.

When formulating the relevance and novelty of scientific work, one should take into account the state of research of specific realities in accordance with the latest scientific publications of scientific academic institutions and leading higher educational institutions of Ukraine.

In the course of familiarization with scientific sources, it is necessary to find out the state of study of the problem in order not to repeat generally known truths in the work, to more specifically and accurately reveal one's own scientific interests. The student must carefully study the literature on the research topic, independently and creatively analyze it, make appropriate notes.

As a rule, published information is sufficient for delineation
problems, definition of unresolved issues, but not enough to solve them. New knowledge and facts are needed, for the search of which it is necessary to define key landmarks. One of these guidelines in scientific research is the working hypothesis, formulated based on the results of the primary analysis of the studied literature.

A working hypothesis is a reasonable assumption that explains unresolved or debatable issues identified at the previous stage of information analysis. An important requirement for a hypothesis is the fundamental possibility of its verification.

After formulating the topic, developing a working hypothesis, there is a need to choose a clearly defined object of research, to which cognitive actions will be directed. The subject of research is understood as a specific characteristic of an object, a process phenomenon that needs to be investigated. The choice of the research subject must be justified. The correctness of its choice will determine the significance and scope of the conclusions.

The goal is formulated after defining the object and subject of the research.

The purpose of scientific workis the planned result that should be reflected in its conclusions. The purpose is related to the topic and the hypothesis. The purpose of the work is revealed in the tasks.

Tasks are steps, the implementation of which involves obtaining the final results, the implementation of which determines the content of the scientific work. Tasks are divided into theoretical and practical (applied). Theoretical - definition of the theoretical foundations of the research. Practical - the tasks are directly related to the analysis and description of the studied material. Ideally, the tasks correspond to the sections that are in the work. The number of tasks approximately coincides with the number of sections, but this is not necessary. A typical mistake is that there is a task, but its solution is not in the work; or vice versa

So, the goal of the research can be interpreted as a strategy for the entire scientific work, and the task as a tactic for its achievement.

Scientific and research the work requires the student to master the research methodology – the use of methods, techniques and methods of material analysis. Special methods represent a set of logical actions of the researcher, standardized methods of collecting, processing and summarizing scientific facts.

In the work, the researcher can also use general scientific methods

research - empirical (experiment, observation, description) and theoretical (analysis, synthesis, abstraction, generalization, induction, deduction, explanation, systematization, classification, etc.). The student must know the methods and distinguish between them.

Implementation of the practical part of the work

The second part of the scientific work is the applied part, reflecting the practical solution of the researched problem.

Before writing the practical part, you must first master the scientific information that will be the basis of the scientific work. For research, you can use all possible methods: analysis and synthesis, experiment, survey, observation. As a result, a hypothesis is formulated that needs to be proved or disproved. The next stage is checking the novelty of the information, its reliability and objectivity.

The main task consists in the analysis of the researched object and subject, on the basis of which the ways of improvement and further development of scientific information regarding the researched topic are determined.

At the final stage of the scientific work, it is necessary to draw general conclusions and check whether they correspond to the original hypothesis, and also highlight the novelty of the research, contain the obtained practical results.

During the writing of the work, a list of used sources is formed, which covers the entire source-based research base. The list of scientific literature includes processed literature, which is directly related to the topic, and scientific

sources of a general theoretical plan that determine the methodology of research work. Compilation of the literature list is carried out according to the requirements of the State Standard.

Appendices are submitted after the list of used sources and are not included in

the total volume of the work. Usually, they have no less scientific value than the content of the research work itself, because they are often represented by dictionaries, tables, diagrams or texts of oral records, etc. They reflect the actual material and conclusions, and therefore are a convincing evidence of the independence of the research.

The final stage in writing a scientific paper is the structuring and grouping of all sections, introduction, conclusions, list of used sources, appendices.

The presented recommendations are general for scientific works from all disciplines. Of course, works from a certain field of knowledge have their own specificity, which is revealed both in the research process itself and in the content of the work and the features of its design.

BASIC REQUIREMENTS FOR WRITING SCIENTIFIC AND RESEARCH PAPERS

WORK

Structure of work:

Scientific work must necessarily contain: • title page; content;

- a list of conditional designations (if necessary); • introduction;
- the main part (divided into sections, subdivisions, points, etc.); • conclusions;
- references; •applications (if necessary).

Requirements for the content of scientific workand

(Appendix A) The title page is a mandatory element of a research paper, which contains the following information: - the name of the Ministry;

- the name of the educational institution where the work was performed; • the name of the cycle commission (department);
- title of work;
- -surname, first name, patronymic of the author;
- -surname, initials, scientific degree and scientific title of the scientific supervisor
- the city and year of writing the work.

The full names of institutions are written, the job title should not contain any abbreviations. It is not customary to break words with hyphens on the title page.

Content.

Content is provided at the beginning of work. Placed after the title page, starts on a new page. It contains a list of names (headings) of all subsequent structural parts of the work (including sections, subsections, items with headings) and numbers of the initial pages of their placement. The writing of headings here must fully correspond to their writing in the text. Subordination of rubrics in the text of the work can be reflected in the "Contents" by increasing the paragraph indentation of each lower level of rubrics compared to the previous one (Appendix B).

List of conventional designations, symbols, units, abbreviations (if necessary)

Some less common conventions, symbols, abbreviations, etc. may be used in the text of the work for the convenience of presenting the material. At the first appearance of such elements in the text, their decoding must be provided. The State Standard establishes the obligation to include in the work a list of such elements with

their explanation as well as a separate structural part that starts on a new page and is placed after the "Contents". The list does not need to be compiled if the specified elements are repeated in the work less than three times.

In scientific works, there may also be a need to highlight a similar list. It is recommended to print it in two columns: on the left - accepted abbreviations, symbols, terms, etc. (in alphabetical order), and on the right - their detailed interpretation.

Introduction.

In the introduction, it is necessary to briefly highlight the current state of the scientific problem within which the research was conducted. Indicate the reasons for the development of the topic, justify the need for conducting research. Then they serve the general

the characteristics of the scientific work in the sequence recommended below: the relevance of the topic, the purpose and task of the research, its novelty, the theoretical and practical significance of the obtained results, the use of general scientific research methods and the explanation of the obtained results, the scope and structure of the work.

Main part.

The main part of the work reflects the research process and its results. It reveals the student's (pupil's) ability to select actual material, independently analyze and describe it, based on theoretical knowledge from relevant fields.

In the main part of the work, three components are scientifically competently combined: a theoretical analysis of the material with references to scientific sources, reliable factual material and conclusions arising from this analysis.

In a separate section of the work, it is necessary to clearly describe the research object, justify the choice of analysis methods, devices, and equipment. If this information is widely known, traditionally used and described in detail in the scientific literature, it is possible not to provide a detailed description of it in the text, but to indicate only the most important details (parameters, substances, conditions) by referring to the relevant sources. Original or little-known methods should be explained in detail (included in the appendix of the work). Methods of statistical data processing based on manuals may not be accompanied by cumbersome mathematical formulas, but it is necessary to provide the full names of the used mathematical indicators and the literary source based on the formulas from which the calculations were made. If the statistical processing was carried out on a computer using replicated programs, it is necessary to specify the name and version of the program and the name of the developer's company (eg: Microsoft® Excel 2000; StatSoft® Statistica 6.0).

The main part of the work presents the results of the author's own experiments, analyzes and summarizes the obtained results, formulates conclusions for each research task. Depending on the number of materials, the range of issues covered and the depth of processing of the latter, the main part of the scientific work is organized into one or several separate sections.

It is important to state as fully as possible all the facts, results of observations and calculations, ideas and hypotheses through the prism of the used methods,

highlight and emphasize the new, original, established by the author.
The text presentation of the material is accompanied by the presentation of larger or smaller arrays of data, systematized according to a certain principle in tables and illustrations. The table allows you to more clearly show the numerous results of experiments, calculations, comparative indicators obtained during the analytical processing of primary data. It is necessary to form compact tables, because perhaps their most important purpose is to promote a concentrated presentation of information, to replace a voluminous verbal presentation. The text should not duplicate the data presented in the tables, but only analyze or summarize them. It is not appropriate to present such digital materials in tables that can be briefly and clearly presented in the text. It is not always worth quoting unprocessed primary digital material in the main part; if the need to indicate this in the work is justified, then it is better to include the corresponding table in the appendices.

Illustrations for scientific papers are quite different: maps, diagrams, sketches, photographs, graphs, diagrams, etc. It is not customary to duplicate the material of the tables with illustrations or vice versa. The illustration is intended to replace an extensive verbal description. It is not necessary, for example, to provide photos (even if the author's) or drawings of familiar objects and those that have a very distant relation to the subject of research without good reason. The number of illustrations in the work is determined by its content.

Conclusions:

In this part of the work, the most important results of research in each of the studied areas are briefly presented. Provided that scientific information is thoroughly processed, it is possible to submit an author's assessment of the state of the problem and the chosen topic from the very beginning. Next, qualitative and quantitative indicators of the obtained results are given, and they are compared with previously known facts. The text of the conclusions most often consists of numbered paragraphs.
The final conclusions for the work should be based on the conclusions formulated in the sections of its main part. It is impossible for the conclusions to contain provisions that do not follow from the conducted research.

References.

The list of used sources is an element of the bibliographic apparatus, which contains bibliographic descriptions of the used sources.
The list of used sources should be placed in one of the following ways: in the order of appearance of references in the text (the most convenient to use and recommended when writing the work), in alphabetical order of the first authors' surnames or titles, in chronological order. Samples of the description of the list of used sources are provided in Appendix B.

Example:

The book of three authors is designed as follows: Akoff R. L., Magidson D., Addison G. D. Idealized design: how to prevent tomorrow's crisis today. Creating a future organization. Dnipropetrovsk: Balance Business Books, 2007. 265 p.

Materials of conferences, congresses: Zinchuk T. O. Economic consequences of the impact of organic food waste on the natural resources of the world. Organic production and food safety: coll. additional materials participation II International

science - practice conf. Zhytomyr: Polissya, 2014. P. 103–108.
Dictionaries: Pirozhkova Yu. V. Charitable organization. Administrative law of Ukraine: a dictionary of terms / edited by : T. O. Kolomoets, V. K. Kolpakova. Kyiv, 2014. P. 54–55.

Electronic resources: Ilyashenko S. M., Shipulina Yu. S. Product innovation policy: textbook. Sumy: University book, 2007. 281 p. URL: ftp://lib.sumdu.edu.ua/Books/1539 (access date: February 14, 2020).
Web page What are organic products and how are they better than conventional ones? Ecology of life: website. URL: http://www.eco-live.com.ua (date of application: 15.11.2019).

Appendices.

In scientific works, appendices are placed after the list of used sources, each starting on a new page in the order of appearance of references to them in the text (references are made to the letter with which the corresponding appendix is designated). Appendices can also be collected in the form of a separate book, primarily due to their large number. Appendices should be marked with capital letters of the Ukrainian alphabet, with the exception of Г, Э, З, И, Й, Й, О, Ч, б, for example, Appendix A.

The appendices contain auxiliary or additional materials necessary for a complete understanding of the work, a better understanding of the obtained results: intermediate mathematical proofs, formulas and calculations, additional tables, graphs, drawings, illustrations, etc. Appendices include material of an additional nature, necessary for the understanding of the work by specialists, but with a large volume, for example: intermediate mathematical proofs, calculation formulas, tables of auxiliary digital data, illustrations of an auxiliary nature, protocols of surveys, tests, etc.

RULES FOR FORMING THE WORK.

general requirements

The research paper is printed in the Times New Roman font of the Word (or Open Office) text editor, size 14, on one side of a sheet of white A4 paper with a spacing of 1.5 (up to 30 lines per page).
Margins: left, top and bottom — at least 20 mm, right — at least 10 mm. The amount of research work is 20-25 (for humanitarian
directions 25-30) of printed pages. The total volume of research work does not include: theses, appendices, list of used sources, tables and figures that occupy the entire page area. The text of the work must be written correctly, without spelling, punctuation and stylistic errors.

Scientific and research works are performed in the state language (in the Russian language and Russian literature sections, it is allowed to be written in Russian); an annotation in a foreign language is added to the work in a foreign language.
Each structural part of the research work begins with a new page. Headings of structural parts are printed in capital letters symmetrically to the set: CONTENTS, LIST OF CONVENTIONAL ABBREVIATIONS, INTRODUCTION, SECTION,

CONCLUSIONS, LIST OF USED SOURCES, APPENDICES. Headings of subsections are printed in small letters (except for the first capital letter) with paragraph indentation. Headings of points are printed in small letters (except for the first capital letter) with paragraph indentation in line with the text.

The distance between the title (except for the paragraph title) and the text should be equal to 3-4 spaces.

Numbering rules in work.

The numbering of pages, sections, subsections, points, figures, tables, and formulas is given in Arabic numerals without the number sign.

All pages of the work, including the title page, theses and appendices, are subject to continuous numbering, the number is not placed on the title page, but on the following

pages is placed in the upper right corner of the page without a period at the end.

Only sections of the main part are numbered. Contents, introduction, conclusions are not numbered.

The section number in the text is placed after the word SECTION, no dot is placed after the number. The section heading is printed on a new line.

Subsections are numbered within each section according to the rule: (section number). (section number). A dot is not placed at the end of the subdivision number, for example: "2.4". The title of the subsection is given in the same line.

Clauses are numbered within each subsection as follows: (section number).(subsection number).(clause number), for example: "2.3.4". The title of the item is given on the same line, but the item may not have a title.

There is no period at the end of the names of sections, subdivisions, and points.

Formulas are numbered within a section. For example, "formula (2.3)" means "formula 3 of chapter 2" (the presence of subsections does not affect the numbering). Formulas to which there are no references may not be numbered. The number must be enclosed in parentheses and placed on the right margin of the page at the level of the bottom line of the formula to which it relates.

Figures are numbered within the section with Arabic numerals (similarly to formulas and subsections) and are marked with the word "Figure", for example: "Figure. 1.2".

Tables are numbered consecutively within a section. In the upper right corner above the table title is placed the inscription "Table" with its number. The table number consists of the section number and the serial number of the table, between which a period is placed, for example: "Table 2.3".

Appendices are drawn up as a direct continuation of the work on the following pages. They are placed in the order of references in the text of the work. Each of the applications should be placed on a separate page. The application has a header, which is printed at the top symmetrically with respect to the text. Appendices are numbered in capital Ukrainian letters and marked with the word "Appendix", for example: "Appendix B".

Citation rules and references to used sources.

When writing a research paper, a student (pupil) must refer to scientific sources, materials, ideas, conclusions, and results used in the work. This allows you

to verify the information provided. Reference should be made to the latest editions of publications.

If the work uses information from materials with a large number of pages, then the page numbers, illustrations, tables, and formulas from the source should be accurately indicated.

References in the text of the work to sources are indicated by the serial number in the list of references, separated by two square brackets, for example, "... in works [1-7]...".

If it is necessary to refer to specific information in the text of the research work, the citation is given in quotation marks, and the references are placed in square brackets with the serial number of the source in the list of used sources and the corresponding page. For example: "... the acquisition of scientific knowledge involves working with facts that characterize a certain phenomenon, developing a scientific hypothesis (theory) that explains this or that phenomenon and setting up an experiment to prove the proposed theory [8, p. 37]".

According to scientific etiquette, the text of the quote must be accurately reproduced and cited in full so as not to distort the author's thoughts. Omission of words, sentences, paragraphs when quoting is allowed without distorting the author's text and is indicated by three dots. In the text of the work, there may be indirect citation of the author (retelling, presentation of the author's thoughts in his own words), while the author's thoughts should be accurately stated and appropriate references to the source should be given.

References to illustrations in the text of the work are indicated by the serial number of the illustration, for example: "fig. 1.2".

References to formulas are indicated by the serial number of the formula in parentheses, for example: "... in formula (2.1)". All tables of the work must be referenced in the text, while the word "table" in the text is written abbreviated, for example: "...in the table. 1.2".

In repeated references to tables and illustrations, the abbreviated word "see" should be indicated, for example: "see. table 1.3".

Formula design rules.

Formulas in the text of the work should be placed immediately after the reference to them. They are separated from the text by intervals of one line at the top and bottom and are placed in the middle of the page. Formulas, if they are cumbersome and complex, are located on separate lines, this also applies to numbered formulas. Several small formulas of the same type are presented in one line separated by a comma, and sometimes small simple formulas are placed directly in the text.

Transfers in the formula are allowed only on the signs of equality, plus, minus, multiplication and division with repetition of the sign in the next line.

The symbols and coefficients given in the formula are described directly below it in the sequence in which they are mentioned in the formula.

The value of each symbol or numeric coefficient is given on a new line. The first line begins with the word "de" without a colon.

The number of the formula is placed on the right side of the page at the level of the bottom line.

Rules for designing illustrations and tables.

Illustrative material in the work is used for the purpose of more clearly presenting the research results and their justification. Most often, the following types of illustrative materials are used in research works: drawings, figures, tables, diagrams, graphs, diagrams, photographs.

All illustrations are indicated in the text of the work.

The name of the illustration is placed immediately after its number, at the bottom.

The digital material of the work is drawn up in the form of tables. The word "Table" begins with a capital letter and is placed in the upper right corner of the page, and its name is in the middle, symmetrical to the text and is given in bold.

Headings of graphs should start with capital letters, subheadings should start with small letters if they form one sentence with the heading, and with capital letters if they are independent. The height of the lines should be at least 8 mm. It is not necessary to include the column with the serial numbers of the rows in the table.

The table is placed (after the first mention of it) in the text so that it can be read without rotating the bound manuscript or with clockwise rotation.

A table with a large number of rows can be moved to the next page. If the table is transferred to another sheet, the word "Table", its number and name are not repeated, then the words "Continue, table" are written above the other parts on the right. and only the table number is indicated, for example: "Continue, table. 1.2".

PROTECTION OF SCIENTIFIC AND RESEARCH WORK.

Public defense is the final stage of scientific research work. It consists of: the author's presentation with a report, his answers to the questions of teachers and listeners, the author leading a discussion on the topic. For the report, each participant in the defense of research works is given up to 10 minutes. During this time, it is necessary to outline the content of the report, demonstrate the availability of visual materials, and certify the use of multimedia technologies.

Presentations of participants based on the results of research work are held in the form of its defense separately in each section. All members of the section are present at the defense and can participate in the discussion.

Determination of the winners of the competition.

The competition has the character of a personal championship. Winners are determined in each section based on the sum of points received by participants in all sections of the competition program.

The best works of the competition participants can be awarded with special diplomas, awards and prizes.

The protection of research work is evaluated according to the following criteria: - argumentativeness of the choice of research topic and methods;

- the degree of independence and personal contribution of the author to the work;
- clarity and logic, consistency and literacy of the presentation of the material;
- qualified conduct of the discussion (comprehensiveness of the answers and content of the questions);
- speech culture, fluency in the material;
- availability and expediency of using additional material illustrating the main results

of the research (multimedia presentation, diagrams, tables, drawings, handouts, etc.).

Materials for self-control:

AND. Questions for self-control:

B. Test tasks and problems

Summing up.

List of recommended literature

Main:

1. Gutorov O.I. Methodology and organization of scientific research: study guide. Kharkiv: KHNAU, 2017. 272 p.
2. Danilyan O.G., Dzoban O.P. Organization and methodology of scientific research: teaching. manual Kharkiv: Pravo, 2017. 448 p.
3. Degtyarev A.V., Kokodiy M.G., Maslov V.O. Fundamentals of scientific research: a study guide. Kharkiv: KHNU named after V. N. Karazina, 2016. 78 p.
4. Kostyukevich V.M., Konnova M.V. Methodology of scientific research: study guide. Vinnitsa. 2017. Vol. 172.
5. Malyhina V.D. Methodology of scientific research. Rivne. 2016. 247 p.
6. Methodology of scientific research: teaching manual. / V.I. Zatserkovnyi, I.V. Tishaev, V.K. Demidov – Nizhyn: NSU named after M. Gogol, 2017. – 236 p.
7. Methodology of scientific research in medicine: teaching. manual / V.D. Babajan, N.S. Bakumenko, O.I. Kadykova and others; under the editorship P.G. Kravchuna, V.D. Babajana, V.V. Meat eater. – Kharkiv: KhNMU, 2020. – 260 p.

Additional:

1. Puzanova O. G. Information provision of evidence-based health care. Part I. / O. G. Puzanova, T. S. Gruzheva // Proof. honey. – 2014. – No. 4 (16). - P. 23-33.
2. Skakun M. P. Fundamentals of evidence-based medicine: monograph / M. P. Skakun. - Ternopil: Ukrmedknyga, 2005. - 244 p.
3. Chernobrovy V. M. Health, pre-disease, disease: medical and social aspects and assessment. Risk factors. Preventive medicine: a guide for graduate students, interns, general practitioners - family medicine / V. M. Chernobrovyi, S. G. Melashchenko, T. M. Tkachuk. – Vinnytsia: Planer, 2013. – 80 p.
4. Shulyak V. I. International experience of using an integrated clinical protocol in medical practice (literature review) / V. I. Shulyak // Ukr. honey. magazine – 2010. – No. 5 (79). - P. 41-44.
5. Howick J. The Philosophy of Evidence-Based Medicine / J. Howick. - Oxford: Blackwell-Wiley, 2011. - 238p.
6. Davis J., Goadrich M. The Relationship Between Precision–Recall and ROC Curves // Proc. Of 23 International Conference on Machine Learning, Pittsburgh, PA, 2006.
7. Fawcett T. ROC Graphs: Notes and Practical Considerations for Researchers. – Kluwer Academic Publishers, 2004. – 38 p.

8. Zweig MH, Campbell G. ROC Plots: A Fundamental Evaluation Tool in Clinical Medicine // Clinical Chemistry. Vol. 39. No. 4. 1993.

Electronic information resources:

1. Best Evidence. URL: http://www.bestevidence.com/
2. BritishMedicalJournal. url http://www.bmj.com/specialties/evidence-based-practice
3. CanadianMedicalAssociation. URL: http://www.cma.ca/
4. Center for Evidence-based Medicine at the University of Oxford. URL: http://www.cebm.net/
5. Clinical Evidence. URL: http://clinicalevidence.bmj.com/x/index.html
6. Cochrane Collaboration open learning material for reviewers. URL: http://www.cochrane-net.org/openlearning
7. Cochrane Library. URL: http://www.thecochranelibrary.com/
8. Current Controlled Trials. URL: http://www.controlled-trials.com/mrct
9. eGuidelines. URL: http://www.eguidelines.co.uk/
10. Evidence-Based Medicine. URL: http://ebm.bmj.com/
11. Canada Clinical Guidelines Database. URL: http://www.phac-aspc.gc.ca/
12. JAMAEvidence. URL: http://www.jamaevidence.com/
13. Medscape. URL: http://www.medscape.com/
14. National Institute for Clinical Excellence. URL: http://www.nice.org.uk/
15. PRODIGY (Clinical Guidance). URL: http://prodigy.clarity.co.uk/

Practical lesson #8

SUBJECT: "Methodological principles of determining the level of science in different countries of the world and in Ukraine." - 2 hours

Goal: The process of implementing scientific research and its stages. Effectiveness of scientific research. The main types of effectiveness of scientific research in medicine. Evaluation of research effectiveness.

Basic concepts:

Term	Definition
Implementation	— is the transfer of scientific products (research results, methods, instructions, report) to the customer of the GDR in a form convenient for implementation, which ensures a technical and economic effect.
Scientific effect	is an increase in the quantity and quality of information or the amount of knowledge in a certain field of science.
Scientific and technical effect	is an increase in scientific and technical information that can be aimed at creating new products or new technology.

Actuality of theme

The purpose of the concept of the implementation of scientific research is to determine the strategic priority directions for the development of scientific, scientific and technical and innovative components of medical academic science for the coming years, to create conditions for increasing the effectiveness of scientific research and using their results to ensure the development of all spheres of social life, to introduce functioning mechanisms with integration a combination of modern forms of the scientific process, training of high-level scientists, implementation of innovative activities and development of the medical field, built on modern fundamental and applied knowledge.

Plan

I. Organizational moment (greetings, checking those present, announcing the topic, the purpose of the lesson, motivating students to study the topic).
II. Control of basic knowledge: Theoretical questions for the lesson:

III. Formation of professional skills and abilities. Practical works (tasks) performed in class:

- Research implementation;
- The main results of scientific research;
- Criteria for the effectiveness of scientific research.

Topic content:

In Ukraine, there is a state system of organization and management of scientific research and provides an opportunity to concentrate and direct science to the fulfillment of the most important tasks, based on the needs of the socio-economic development of the state. The state system of science

management aims to develop strategic and tactical solutions for the implementation of fundamental and applied research, increase their efficiency, select the most promising scientific topics, provide research information, and economically stimulate their activity.

The legislative basis for the organization of science is created by the Verkhovna Rada of Ukraine. The executive body that develops and implements measures to implement a unified policy in the field of science is the Cabinet of Ministers of Ukraine, which is subordinated to institutions and organizations that carry out direct management of scientific activities in the state: the Ministry of Education and Science of Ukraine, the National Academy of Sciences of Ukraine, branch academies of sciences , sectoral and inter-sectoral ministries, committees and departments.

The organization of science in the state includes four main sectors:

1) ***academic***- aimed at providing fundamental research that leads to new knowledge, ideas and theories;

2) ***university***- aimed at providing fundamental and applied research that provides new knowledge and developments suitable for practical application;

3) ***industry***- aimed at conducting applied research and implementation of developments and innovations;

4) ***industrial***- related to the introduction of scientific and technical developments, improvement of equipment and technologies, thanks to which inventions are made, new equipment and new products are created. Direct scientific activity in Ukraine is carried out by:

- *research and design institutions and centers of the National Academy of Sciences;*
- *research institutions of the system of branch academies of sciences;*
- *research units and departments of higher educational institutions (institutes, academies, universities);*
- *research, design, construction, technological and other institutions of ministries and agencies;*
- *research, design institutions and centers at industrial enterprises and associations;*
- *research, design, technological and other institutions and centers created on a commercial basis.*

The specified set of scientific institutions and organizations forms the organizational system of science in the state. The hierarchical structure of this system is crowned by the Ministry of Education and Science of Ukraine. It is the highest state body that solves the task of comprehensive use of the achievements of science and technology in all branches of social production.

The exclusive competence of the Ministry includes carrying out scientific and technical forecasting, ensuring the concentration of resources of academic, university and branch science in priority areas of scientific and technical progress, managing the state system of scientific and technical information, deepening scientific and technical cooperation with other countries of the world. The Ministry is the highest functional body of the state management of science,

which is empowered to implement scientific policy, plan, forecast and monitor the scientific activity of all scientific institutions and organizations of Ukraine.

In the system of state organization of science, an important place belongs to the Department of Personnel Attestation (DAK of Ukraine), which is a structural subdivision of the Ministry of Education and Science of Ukraine and manages the attestation of highly qualified scientific personnel, ensuring the unity of requirements for candidates and doctor of science degrees, and monitors the quality of dissertation works , their scientific and practical significance, thereby participating in the formation of the scientific potential of the state.

The main task of the personnel certification department is to participate in: forming and ensuring the functioning of the scientific personnel certification system; formation of a network of specialized scientific councils and analysis of their activities; the formation of a network of expert councils for the examination of dissertation works and the organization of examination of dissertations in order to establish their compliance with state requirements for obtaining the scientific degrees of doctor, candidate of sciences.

Personnel Certification Department in accordance with the tasks assigned to it: participates in the Main Scientific Center of Ukraine - the National Academy of Sciences. Giving her a higher rank scientific institutions of Ukraine is determined by the objective needs of society in deepening and systematic development of fundamental problems in the field of social life, natural science and technology. It has historical prerequisites enshrined in the legal status of the Academy and is based on the material and technical support of the state. The National Academy, as a specialized higher sectoral body of science, coordinates all scientific research in Ukraine. As a scientific center, the Academy began its activities on November 27, 1918 (since 1921 - the All-Ukrainian Academy of Sciences - VUAN, since 1936 - the Academy of Sciences of the Ukrainian SSR, since 1937 - the Academy of Sciences of the Ukrainian SSR, now - the National Academy of Sciences of Ukraine) - on this day, Hetman Skoropadskyi signed a decree on the creation of the Ukrainian Academy of Sciences.

The presidents of the Academy during all the years of its existence were V. Vernadskyi (1919-1921), V. Lepskyi (1922-1928), D. Zabolotnyi (1928-1929), O. Bogomolets (1930-1946), O. Palladin (1946-1962), since 1962 - B. Paton.

The purpose of the National Academy of Sciences of Ukraine is defined in its Charter:

- *development of fundamental research in the leading areas of social and natural sciences;*
- *implementation of promising scientific research directly related to the development of production, first of all in the defining branches of technical progress;*
- *identification of fundamentally new opportunities for scientific and technical progress and preparation of recommendations for their application in the national economy;*

- *studying and summarizing the achievements of world science and promoting their most complete implementation in social practice.*

The National Academy of Sciences unites outstanding scientists of Ukraine.

The main link of the structure of the National Academy of Sciences of Ukraine are research institutes and scientific institutions equivalent to them.

In the structure of the National Academy of Sciences of Ukraine there are national institutions - the National Library of Ukraine named after V.I. Vernadskyi, National Scientific Center "Kharkiv Physical and Technical Institute", National Historical and Archaeological Reserve "Olvia", National Botanical Garden named after M.M. Hryshka, Sofiivka National Dendrological Park, National Science Museum, Lviv National Scientific Library of Ukraine named after V. Stefanyka, National Center "Small Academy of Sciences of Ukraine" MES of Ukraine and NAS of Ukraine.

In addition to the National Academy of Sciences, there are national sectoral academies of sciences in Ukraine: the National Academy of Agrarian Sciences, the National Academy of Medical Sciences, the National Academy of Arts, the National Academy of Pedagogical Sciences, and the National Academy of Legal Sciences.

Education systems in the countries of the world

One of the driving forces of progress in any area of human activity and knowledge is the synthesis of accumulated world experience. In the conditions of the reform of the education system in our country, the study and analysis of trends in the development of education abroad is becoming more and more important.

As you know, the education systems in the leading countries of the world are currently undergoing democratization processes. Its essential feature - along with accessibility, variability and differentiation, decentralization of management - is openness, continuity of all its levels.

Nowadays, the world community determines the content of new education, the latest learning technologies are developed and implemented, and the educational process is constantly being improved. Many important factors contribute to this: the growing amount of knowledge, skills and abilities needed by schoolchildren, the results of research into the nature of childhood, and the experience of educational institutions in different countries. In addition, global education must meet the new level of production, science, and culture. This means that updating the education system is an urgent and inevitable task.

Education is one of the crucial life values. The desire for education is due not only to the desire to master knowledge as a guarantor of the extraction of material goods, but also to the awareness of the need for a broad culture. When ranking life values, the majority of the population of the developed countries of the world prefers education.

So, we can say that the analysis of different education systems and the identification of their advantages and disadvantages make it possible to highlight

the prerequisites and trends for the formation of a unified educational space.

Based on this, the purpose of this control work is to study modern education systems (using the example of the USA, Great Britain, and Germany).

The object of study is the educational systems of modern countries, and its subject is the analysis of various aspects of education systems in developed countries.

Objectives of the study:

- Study the pedagogical literature on the research problem;
- Analyze the educational systems of modern countries (on the example of the systems of the USA, Great Britain, Germany);
- Identify specific features of the development of the educational systems of these countries.

The purpose and objectives of the research determined the choice of its methods:

1. Analysis of pedagogical literature and periodical press publications.
2. Notes, referencing sources.

The structure of this work includes: an introduction, three sections, a conclusion and a list of references.

1. Characteristics of educational systems

1.1 Great Britain

1.1.1 Primary and secondary education

In recent decades, education in Great Britain has become one of the most priority directions in public policy, regardless of which political forces are in power. Decision-making, which determines the prospects for the development of the industry, is carried out at the highest level in the hierarchical management structure of the parliament and the government. The first act of national importance is considered to be the Law on Education of 1944, which, although it was mainly devoted to school education, largely regulated the education system as a whole and defined its management bodies. Then the adopted acts were revised and supplemented. But by the 60s, there was a need to review and improve the quality of education, it has a tendency to exist in modern England as well. Thus, the National Commission for Education of Great Britain published in 1993. a report with the eloquent title "Learning to thrive. A radical view of education today and a strategy for the future", which presents recommendations on how to achieve positive changes in education.

According to the administrative division and established traditions, the education system of Great Britain is divided into three subsystems: 1) England and Wales, 2) Northern Ireland and 3) Scotland. The education systems of England, Wales and Northern Ireland differ slightly in their structure, the education system of Scotland has its own traditional features. The modern education system of Great Britain includes: preschool education, primary education, general secondary education, the system of further education and higher education.

In Great Britain, about 50% of three- to four-year-old children are brought

up in kindergartens or early childhood centers. Compulsory education begins at the age of 5, and children enter a school for toddlers.

The compulsory education system covers children and adolescents from 5 to 16 years of age. According to the Education Reform Act (1988), the period of compulsory education is divided into four "key stages": from 5 to 7 years, from 7 to 11 years, from 11 to 14 years, from 14 to 16 years.

Primary education covers the first two stages (from 5 to 11 years). Children are usually grouped by age. All subjects are taught by one teacher. The lesson lasts from 15 to 45 minutes. After graduation, children do not pass exams and do not receive certificates of completion of the educational institution. In elementary school, the main time is devoted to learning English (40% of the teaching time), 15% is occupied by physical education, about 12% by manual work and art, the remaining hours are divided between lessons of arithmetic, history, geography, natural science and religion.

In the general secondary education system of Great Britain, two main types of schools are distinguished: grammar and combined (in addition to them, technical and modern secondary schools also function). The most common type of schools are joint schools. About 90% of students in England study with them. Graduates of primary schools with different levels of mental abilities and capabilities are admitted to the combined school. Unified schools were organized to create equal educational opportunities. They had to ensure the joint education of students with different abilities, interests and capabilities. Grammar schools provide general secondary education and prepare students for higher education. After the end of the 5th grade, approximately 60% of students who have passed the exams and obtained a general certificate of education at the ordinary level leave the school. The other 40% continue their studies according to individual curricula, in the two-year 6th grade, which is a graduation.

The system of further education (in our understanding "secondary professional education") is a conglomerate of a large number of various colleges, educational centers, institutes, which provide training at various levels from vocational to higher education. In total, there are about 700 specialized educational institutions in the system of further education, from local colleges, in which young people aged 16-18 study continuously from work at the factory, to polytechnic, comprehensive educational institutions, in which training is carried out at various levels, including and higher

All institutions of the further education system are under the control of local bodies. The exception is educational institutions with royal charters. Compared to previous years, the number of full-time students in the general student contingent is increasing. Since the 1960s, significant changes have taken place in the system of further education. Its educational institutions were given the right to award academic degrees, that is, it became possible to obtain higher education not only in universities, but also in polytechnic educational institutions opened on the basis of the largest technical and commercial colleges. Currently, polytechnic colleges are the main institutions of the further education system, which concentrate the training of specialists with higher education.

Vocational training is carried out in unified schools, technical (professional) colleges, vocational training centers and employment centers. Vocational colleges are in a special place. Here there is the widest range of training - from a skilled worker to an intermediate level specialist. Colleges are closely related to on-the-job training. The terms of study at the professional college vary from one to five years.

1.1.2 Development of the higher education system

Higher education in Great Britain is represented by universities and polytechnic colleges. Until the 60s, it was carried out exclusively in universities. But in the 1950s and 1960s, the contradictions between the possibilities of the education system at all levels and social needs of a socio-economic nature began to sharply intensify in Great Britain. Education reforms in Great Britain started with the higher school. At the beginning of the 60s, the country began to experience an acute shortage of highly qualified personnel.

The 60s were marked by the rapid growth of university education. During this period, 23 universities were established in the country, or half of the existing ones.

In 1964-1977, a new type of higher education institution was created for Great Britain - a technological university. 10 former "colleges of advanced technology" became technological universities.

In 1969 the world's first distance learning university - the Open University - was created. During the 1960s and 1970s, the number of university students more than doubled (in 1970, 259,000 students studied at UK universities), and the total number of universities increased to 45.

In parallel with the development of university education, the formation and expansion of the public sector of higher education, professionally oriented and designed to meet local needs, is taking place. Its foundation was formed by 30 polytechnic colleges created in 1969-1970 as a result of the merger of a number of technical, commercial and art colleges. The importance of the alternative sector of higher education is continuously growing.

Thus, in the 1960s and early 1970s, a binary system of higher education was formed in Great Britain, represented, on the one hand, by universities, on the other, by polytechnic colleges and other educational institutions of the public sector of higher education.

As for the government in 1979. conservative government began to implement the tactics of convergence of the two sectors of higher education, equalization of the legal basis of activity of all higher educational institutions, regardless of their status. The main measures of this period were aimed at encouraging the activities of higher educational institutions to improve management and financing mechanisms in order to meet the socio-economic needs of the country.

Funding became the main lever of influence on the higher education system. In the early 1980s, the government implemented a number of measures to reduce the costs of university education in order to use them more rationally. Mainly natural and engineering-technical areas of training are developed,

commercial activity of universities is encouraged, expansion of their contacts with industrial and commercial spheres. The autonomy of universities is sharply limited, because the government requires reporting on the expenditure part of the budget, which was new in university life, and also introduces control over the regulation of the number and their distribution according to the directions of student training, formation of the content of education, directions of scientific research. Direct control over the activities of universities by the Royal Inspectorate is carried out. First of all, this refers to the setting of pedagogical education in universities.

If for universities the main problem has become the professionalization of education, then for polytechnic colleges - strengthening general scientific and general professional training. The latter from the very beginning had strong ties with industrial and commercial enterprises and firms. However, they were largely dependent on local educational authorities in financial, administrative, and educational terms. Therefore, the main task of these colleges was to limit the "petty" guardianship of local authorities and transfer them under the jurisdiction of central education authorities. In this respect, the goals of universities and polytechnic colleges were opposite in nature.

It should also be noted that according to the structure, universities are divided into collegiate and unitary. The most striking example of collegiate universities is Oxford and Cambridge, which, respectively, include 39 and 29 colleges. Unitary universities include faculties and departments.

The activities of universities are regulated by their royal charters or statutes.

The university is formally headed by a chancellor, who is appointed by the Queen and who is, as a rule, a ceremonial figure. In reality, the head of the university administration is the vice chancellor or rector. The governing bodies of universities are the council and the senate. The council is the highest administrative body that forms the teaching and auxiliary staff, resolves financial issues. The Senate is an academic body. The head of the council and the senate is the elected vice-chancellor. The composition of management bodies is also chosen. Recently, representatives of professors and teaching staff, students and external organizations interested in training specialists began to enter the governing bodies on a parity basis.

The academic year at universities in Great Britain begins in October and is divided, as a rule, into trimesters of 8-10 weeks each. The duration of the summer vacation is four months - from June 1 to September 30.

The system of examinations in universities is determined by charters, but in most cases two main examinations are held - at the end of the 1st and 3rd years of study; the type and level of the assigned degree is usually established based on the results of the exams. Graduates of higher educational institutions are awarded academic degrees; university and Councils with national academic qualifications.

The higher education reform currently underway in Great Britain under the Further and Higher Education Act provides for:

· Creation of a single funding structure for universities, polytechnic institutes and colleges of the higher education system;

· Further improvement of the quality of specialist training and, for this purpose, organization of external control over the quality of training with the help of a nationwide audit body created by universities;

· Establishing closer ties between universities and industrial enterprises and commercial structures for further economic development of the country;

· Expanding access to higher education for the country's adult population

Thus, the improvement of the education system of Great Britain in recent decades is one of the notable processes of the country's social and cultural life, a reliable tool for solving the country's socio-economic problems.

1.2 Germany

The education system in Germany is a classic three-level structure consisting of primary, secondary and higher education. Both state and private educational institutions are represented at all levels of this structure, although the number of the latter is small. The German state guarantees all citizens compulsory secondary education, so education in public primary and secondary schools is free. In most cases, education at state universities is also free.

The main features of the modern education system in Germany were formed during the period of the Weimar Republic (1920s), when the secondary school was divided into a full public school, a real school and a gymnasium. Until the beginning of the 1950s, education in a real school and gymnasium was paid.

The network of preschool children's institutions in Germany is poorly developed. A small number of kindergartens, which are mainly privately owned, cover children aged 3-5 years.

Schooling begins at the age of 6 and is mandatory for 9, and in some countries 10 years.

The first step in the school system is primary school: I - IV grades, in some countries I - VI grades. In primary grades, especially in the first 2 years, comprehensive training is widely used. German language, arithmetic, local history, music, physical education, religion are taught in the complex. Only in grades III and IV are individual subjects distinguished, although language, local history and music continue to be taught in the complex.

Education in a full folk school lasts until IX or X grade. This type of educational institution is aimed, first of all, at obtaining a profession: professional skills classes are generally attended by students more willingly than classes in other subjects.

The German education system does not create dead-end situations in the sense of continuing education, and those who have completed a full public school can receive a certificate of a real school if a number of conditions are met (additional attendance of classes, taking exams). The real school is characterized by West German teachers as "theoretical-practical". Unlike a full public school, physics, chemistry, biology and English are taught as compulsory subjects in the real school. Mathematics is taught at a higher level. Successful students of real

schools can transfer to gymnasiums.

Gymnasiums are the only educational institutions that provide access to higher education. No more than 16% of teenagers of the corresponding age study at its junior levels. During the course of education, there is a dropout of schoolchildren, which is especially large after the X grade, as well as at the transition from the secondary to the senior level of the gymnasium (XI - XIII grades). Only half of those who enrolled in the 13th grade graduate from the gymnasium.

In the former GDR after reunification, the first step in the transition of the secondary education system to new operating conditions was the creation of three types of schools: full folk, real and gymnasium. However, so far they exist as if one above the other: the end of the X grade is equated to the end of the full folk school, and the IX grade is divided into the final grade of the full folk school and the IX grade (primary) of the real school. A graduate of class X receives a certificate of completion of a real school, and classes XI - XII have the status of a high school degree. The first half of the X class is considered probationary, and during this period there is a significant dropout, so that the number of real school graduates who study in gymnasium is about 16%.

The state system of vocational education is mandatory for graduates of a comprehensive public school. Of all the students in it, the vast majority attend classes in a vocational school of a lower type without separation from production, where they complete an apprenticeship. Classes at the school last 6-8 hours a week for 3 years.

The system of advanced vocational schools is very diverse. It contains many "specialty schools" - housekeeping, medical, agricultural, etc. with a period of study of 1 - 4 years. These schools train skilled workers mainly for the service sector.

The system of higher education in Germany unites 326 educational institutions, the vast majority of which are state (non-state universities are required to have a state teaching license).

It should also be noted that the policy of the federal government is aimed at strengthening cooperation between universities and industrial firms. Since the 1950s, the form of "joint research" has become widespread, when small and medium-sized firms in a certain industry create an alliance with a university (or a research institute) to work on problems that the member firms of the association are interested in solving.

It is important that not only the internships of company employees are practiced in universities, but also the work of students and young scientists in companies. This is especially characteristic of special (professional) higher education institutions, where even teachers are obliged to undergo practice at a company from time to time.

One of the promising features of the German education system, including higher education, is the Education Promotion Act. For students, it provides monthly payments of approximately 600 marks, and half of the funds are transferred as free grants, and the other - as a loan (students are paid funds

exclusively in the form of grants, but in order to receive the right to such a scholarship, they must present documents proving that , that parents are unable to support them).

The modern German school is a unique pedagogical space, within the framework of which there is not so much territorial reunification as spiritual, worldview development of the German nation. At the same time, one of the priority tasks at present is joining the "single European school" with the mandatory preservation of the best national traditions. In this regard, Germany is reviewing the goals and objectives of secondary education, modernizing its content in anticipation of the requirements of the future world.

1.3 United States

The modern education system of the USA, which has developed under the influence of historical, economic and social factors, is characterized by a number of features that distinguish it in many respects from Western European standards. There is no unified state education system in the USA, each state has the right to determine its structure independently.

The modern education system of the USA is built on the principles of self-government, self-financing and self-determination with the effective interaction of federal and local authorities.

The idea of local self-government of the school is seen as essential for the nation. In practice, this means that the committees of individual states develop regional school policies, establish mandatory standards of educational programs, distribute allocations between districts, determine qualification requirements for teachers, and deal with material and technical equipment of schools. As you can see, the main questions - why teach, who teaches and for what fee, how to evaluate and transfer a student to the next class, under what conditions to hand out certificates of education, which textbooks to use - are within the competence of the states.

The modern education system of the USA includes pre-school institutions, general education "comprehensive" school (full secondary education - 12 years of study) and so-called poslesrednego educational institutions (professional and higher).

Preschool institutions almost until the middle of the 20th century. were perceived by the majority of the population as organizations of social assistance to the poor. In the 2nd floor 20th century in conditions of wide opportunities for choosing part-time occupations, about half of American mothers still prefer to raise children aged 3-5 at home. Among whites, the share of such mothers is higher. Preschool education and training programs aim to prepare children for primary school. They are diverse, flexible in essence and democratic in content, aimed at teaching independence, initiative, and communication skills. At the same time, preschool institutions maintain close contact with parents.

From 6 to 12 years of age, children study in primary (elementary) school. The primary education program includes English language and literature, mathematics, natural science, civics, labor training, a cycle of aesthetic education (music, drawing, singing, sculpting), sports and physical education. It

provides basic skills and knowledge, develops a conscious attitude to learning.

Secondary school (college of secondary education) usually consists of two sections: junior and senior. In the junior high school (junior high school) (7th-9th grades), a third of the study time is devoted to the general program for all, and the rest to the study of subjects of choice (electives). Upper secondary school (grades X-XII) usually offers a compulsory set of five subjects and a variety of educational profiles of academic and practical orientation.

In 1993, more than 85,000 educational institutions provided general education. There were more than 35 million students at the primary and lower secondary level; more than 12 million students received full secondary education (or appropriate vocational training). 1.4 million teachers were engaged in teaching work at the primary and lower secondary school level, and about 1.1 million teachers at the upper secondary school level.

Vocational training is carried out in secondary schools, regional vocational centers (organized with the help of cooperation of several secondary educational institutions) and centers of professional skills. Students acquire various specialties at the level of a skilled worker. The scale of professional and technical training is very significant. Students are usually offered at least two or three professional training courses. In a number of schools, this set reaches six courses. At least two-thirds of secondary school students study at least one vocational training program.

Higher education in the USA is characterized by a significant variety of educational programs, courses and disciplines, being a single social institution that performs important economic, social and ideological functions.

In the 1990s, the higher education system was the most dynamically developing branch of education in the United States.

American universities usually represent educational towns, so-called campuses. They have educational and laboratory buildings, libraries, dormitories, residential buildings for teaching staff, catering facilities, sports and cultural facilities.

Attracting talented young people to technical universities, the need to reorganize the education system for obtaining master's (2nd academic) and scientific - doctorate degrees remains an urgent problem of higher education. According to scientists' forecasts, in the coming century there will be a significant shortage of engineering and technical specialists.

An important indicator of the level of a university is the so-called degree of selectivity. Almost 1,400 universities accept all who apply; more than 100 universities of individual states are considered highly selective, although the rule of preferential enrollment of "local" applicants applies to them. Private selective universities accept about 30% of applications. Identifying the best and creating favorable conditions for them continues throughout the entire period of study. Another important indicator of the quality of a university is the ratio of students to teachers. In the best universities in the USA, there are 6 students per one teacher; among university mentors, the share of doctors of science is about 97%.

High-quality implementation of the principles of improvement of higher

education, their adaptation to a constantly changing society, will allow to rise to the level of awareness of new knowledge and skills necessary for a modern person, to properly assess the new information and technological era.

2. General analysis of education systems

2.1 Secondary education

In the second half of the 20th century, reforms of the general education system were carried out in the leading countries of the world. The terms of compulsory free education have increased. There is an intermediate level between primary and secondary school.

Upon completion of primary and part-time secondary education, students are divided into three main educational streams: comprehensive secondary school, which focuses on theoretical training and further study at the university; secondary school with an emphasis on preparation for study at a technical university; professional educational institutions.

Along with the state ones, there are private educational institutions. They are usually paid. Some of them are privileged (English "public schools", American independent schools, etc.).

State policy regarding private schools in different countries is based on different principles. B US authorities pay less attention to them than to public educational institutions, which is expressed, first of all, in funding advantages. In Great Britain, private and public schools enjoy equal rights when subsidized.

In almost all the leading countries of the world, school is a priority object of financing. In the early 1990s, the share of education expenses in the total amount of expenses was: USA, England - about 14%, Germany - about 10%. In the 1980s, school appropriations in these countries grew faster than the overall national income, establishing themselves as one of the main items of the budget.

Maintaining school education at a fairly high level is an important prerequisite for the dynamic development of society. Highly developed industrial states have achieved impressive economic achievements in many ways, thanks to the influx of qualified and trained personnel from the education system.

Note that there is no fixed combination of criteria and indicators of educational effectiveness. We are talking not only about the training of well-educated youth, but also about the formation within the walls of educational institutions of a capable, proactive generation that follows the ideals of humanism.

Basically, the pedagogical circles of all studied countries believe that to improve the level of education, first of all, it is necessary to modernize the content, forms and methods of school education.

In the leading countries of the world, active attempts are made to increase the effectiveness of education. In the West, the USA is leading the movement to improve the quality of education. In this country, central and local authorities, teachers and the public are united in a common desire to improve school performance. A certain accreditation procedure is used to stimulate the relevant

activities of individual educational institutions. In the case of successful accreditation, when the ability of the educational institution to provide quality education is confirmed, the school receives additional credits.

No less care is taken to improve the quality of education in other countries. Thus, the National Commission for Education of Great Britain published in 1993. a report with the eloquent title "Learning to thrive. A radical view of education today and a strategy for the future." Recommendations on how to achieve positive changes are formulated in the form of several goals: reducing the volume of compulsory education, improving the system of teacher training, concentrating education management and teacher training in the hands of one body, increasing investment in education, expanding public participation in activities schools

In conclusion, several main regularities of the general secondary education of the studied countries can be identified:

• duration of education in a full secondary school is about 12 years;

• full secondary school is mainly divided into 3 levels: primary, secondary and senior;

• it is mandatory to study only in secondary school, after which the student chooses the further path of obtaining education: academic - for the purpose of entering a university or professional - for obtaining secondary special education;

• in high school (this is, as a rule, 10-12 grades), specialized training - with the number of areas of specialization from two to four;

• the number of compulsory academic subjects in high school is significantly reduced, as a rule, to 58, the study of which is emphasized during the next period of study;

• in some countries, not all students receive a high school graduation certificate (diploma, certificate);

• in most countries, admission to higher education institutions takes place based on a competition for certificates (diplomas, certificates) or based on the results of testing, which is uniform for the country or individual for higher education institutions, based, as a rule, on measuring the level of the applicant's abilities.

2.2 Higher education

In the studied countries of the world, higher education networks have expanded dramatically over the last quarter of a century. This process reflected the growing role of higher education in economic progress, enrichment of ideas about life ideals. The social composition of the student body has changed noticeably: it has become more democratic. The content of university and non-university higher education programs is changing.

The key problem of the policy of the leading countries of the world regarding higher education is maintaining the quality of education. To solve this problem, the mechanism of state control over the activities of the higher education institution is being reformed. Yes, in England since 1993. there is a system of evaluation of the quality of higher schools implemented by the Council of Higher Education. The amount of state subsidies for individual

educational institutions depends on the results of such an assessment. A similar system operates in the United States. In some states, similar evaluation is carried out by special educational quality control agencies.

The competition of states in the field of higher education has intensified - this is, in fact, the competition of the economy, since education in modern conditions has become the main source of economic growth. According to American scientists who study the problems of the economy of education, 15-20% of the growth of the national income is attributed to the share of the latter. In addition, from 20 to 40% of growth is given by the improvement of scientific knowledge and its application - a process in which the leading role belongs to higher educational institutions, which is where the majority of fundamental research is concentrated in all Western countries.

The importance of the contribution of higher education to reforming society is confirmed by world experience. It shows that all countries that successfully overcame the transition to modern market relations considered the sphere of higher education as a priority and proceeded from this in their investment policy.

The political elite in Great Britain, Germany, and the United States formed a kind of cult of education, supported by regular meetings of heads of state with the best students, graduate students, and teachers and presenting them to the public as the "intellectual value of the country."

Such meetings emphasize that education is the main indicator of the quality of life, the core of economic power and creative potential of every person.

Conclusion

It is natural that the problems of education have always occupied the most important place in the activities of any state: it is education that is one of the fundamental means of reproduction and development of society and human culture, spiritual, intellectual and professional potentials of society. Recently, marked by a transition period for the development of society, the topic of education, due to a number of objective and subjective conditions, has come to the center of public ideas and discussions, in which almost all strata and groups of the population participate, representatives of science from different countries, all branches and levels of legislative and executive power.

The need to understand the real problems of education in modern conditions is becoming more and more relevant and significant. This is determined not only by the reasons of the socio-economic order, but to a large extent by the change of paradigms of social development. All this, of course, affects the state and prospects of the development of education as the most important part of the social sphere, a cultural phenomenon, one of the drivers of the progressive social movement.

Having analyzed the current trends in the development of the educational systems of the leading Western countries, we can conclude that each of these countries has certain established traditions in the field of education, which are related to the features of their socio-economic development, historical and

national conditions. But at the same time, they have a certain similarity in the problems of school reform, related to the modernization of the content of education, which leads to the unification of the efforts of the entire world community to solve these problems.

So, it can be said that the comparative analysis of different education systems and the identification of specific approaches to the content of education make it possible to highlight the prerequisites and trends for the formation of a unified educational space.

Materials for self-control:
AND. Questions for self-control:
B. Test tasks and problems

Summing up.

List of recommended literature

Main:

1. Gutorov O.I. Methodology and organization of scientific research: study guide. Kharkiv: KHNAU, 2017. 272 p.
2. Danilyan O.G., Dzoban O.P. Organization and methodology of scientific research: teaching. manual Kharkiv: Pravo, 2017. 448 p.
3. Degtyarev A.V., Kokodiy M.G., Maslov V.O. Fundamentals of scientific research: a study guide. Kharkiv: KHNU named after V. N. Karazina, 2016. 78 p.
4. Kostyukevich V.M., Konnova M.V. Methodology of scientific research: study guide. Vinnitsa. 2017. Vol. 172.
5. Malyhina V.D. Methodology of scientific research. Rivne. 2016. 247 p.
6. Methodology of scientific research: teaching manual. / V.I. Zatserkovnyi, I.V. Tishaev, V.K. Demidov – Nizhyn: NSU named after M. Gogol, 2017. – 236 p.
7. Methodology of scientific research in medicine: teaching. manual / V.D. Babajan, N.S. Bakumenko, O.I. Kadykova and others; under the editorship P.G. Kravchuna, V.D. Babajana, V.V. Meat eater. – Kharkiv: KhNMU, 2020. – 260 p.

Additional:

1. Puzanova O. G. Information provision of evidence-based health care. Part I. / O. G. Puzanova, T. S. Gruzheva // Proof. honey. – 2014. – No. 4 (16). - P. 23-33.
2. Skakun M. P. Fundamentals of evidence-based medicine: monograph / M. P. Skakun. - Ternopil: Ukrmedknyga, 2005. - 244 p.
3. Chernobrovy V. M. Health, pre-disease, disease: medical and social aspects and assessment. Risk factors. Preventive medicine: a guide for graduate students, interns, general practitioners - family medicine / V. M. Chernobrovyi, S. G. Melashchenko, T. M. Tkachuk. – Vinnytsia: Planer, 2013. – 80 p.
4. Shulyak V. I. International experience of using an integrated clinical protocol

in medical practice (literature review) / V. I. Shulyak // Ukr. honey. magazine – 2010. – No. 5 (79). - P. 41-44.

5. Howick J. The Philosophy of Evidence-Based Medicine / J. Howick. - Oxford: Blackwell-Wiley, 2011. - 238p.

Electronic information resources:

1. Best Evidence. URL: http://www.bestevidence.com/
2. BritishMedicalJournal. url http://www.bmj.com/specialties/evidence-based-practice
3. CanadianMedicalAssociation. URL: http://www.cma.ca/
4. Center for Evidence-based Medicine at the University of Oxford. URL: http://www.cebm.net/
5. Clinical Evidence. URL: http://clinicalevidence.bmj.com/x/index.html
6. Cochrane Collaboration open learning material for reviewers. URL: http://www.cochrane-net.org/openlearning
7. Cochrane Library. URL: http://www.thecochranelibrary.com/
8. Current Controlled Trials. URL: http://www.controlled-trials.com/mrct
9. eGuidelines. URL: http://www.eguidelines.co.uk/
10. Evidence-Based Medicine. URL: http://ebm.bmj.com/
11. Canada Clinical Guidelines Database. URL: http://www.phac-aspc.gc.ca/
12. JAMAEvidence. URL: http://www.jamaevidence.com/
13. Medscape. URL: http://www.medscape.com/
14. National Institute for Clinical Excellence. URL: http://www.nice.org.uk/
15. PRODIGY (Clinical Guidance). URL: http://prodigy.clarity.co.uk/

Practical lesson No. 9

SUBJECT: "Statistical methods used to evaluate the results of scientific research" - 2 hours

Goal: forming a system of special knowledge among students about the peculiarities of the design of the results of statistical research and the preparation of scientific publications.

Basic concepts:

Term	Definition
Master's theses	— these are independent theoretical and/or applied studies, which are based on a critical analysis and generalization of existing information, conducting own research, carrying out developments and forming applied targeted recommendations.
Dissertations for the Doctor of Science degree	— these are qualifying works containing new scientific provisions and scientifically based results in a certain field of science, which solve an important scientific or scientific-applied problem and for which the acquirer is the subject of copyright.
Dissertations for the Doctor of Philosophy degree	are independent detailed studies that offer a solution to an actual scientific task in a certain field of knowledge or on the border of several fields, the results of which constitute an original contribution to the amount of knowledge in the relevant field (fields) and are published in relevant publications.

Actuality of theme

Statistical research is not limited only to its planning, organization and conduct. Moreover, the results of such research are not an end in themselves, but a basis for making decisions aimed at improving the situation in the relevant area. For a comfortable familiarization with the results of a statistical study, it is given the appropriate status (a certain type of scientific product) and properly formalized.

Plan

I. Organizational moment (greetings, checking those present, announcing the topic, the purpose of the lesson, motivating students to study the topic).

II. Control of basic knowledge: Theoretical questions for the lesson:

1. What is a "scientific activity product"? Describe its main types.
2. What can be done to improve the quality of content of a scientific product?
3. How are the theoretical, analytical, and conceptual parts of a scientific product related to each other?
4. Criteria for evaluating a scientific product.
5. Requirements for the design of a scientific product.

6. General requirements for the substantive part.
7. Requirements for design of illustrations and tables.
8. Requirements for the style of presentation of materials.
9. Requirements for drawing up a list of used sources.
10. Peculiarities of preparation of scientific articles.
11. Peculiarities of preparing theses of reports and their presentations for a professional communicative event.

III. Formation of professional skills and abilities. Practical works (tasks) performed in class:

- Types of scientific products;
- Processing of resultsstatisticalresearch;
- Basics of preparation of scientific publications.

Topic content:

Statistical research is not limited only to its planning, organization and conduct. Moreover, the results of such research are not an end in themselves, but a basis for making decisions aimed at improving the situation in the relevant area. For a comfortable familiarization with the results of a statistical study, it is given the appropriate status (a certain type of scientific product) and properly formalized.

Types of scientific product:

Fundamental:

– scientific ideas;
- hypotheses;
– methods and corresponding material means of observation during the experiment; methods of recording research results;
– scientific laws;
– scientific facts;
– conceptual and categorical apparatus;
- postulates;
- rules;
- principles;
– theories;

Applied:

- algorithms;

– means of visualization (diagrams, graphs, tables, drawings, maps);

– layouts;

– useful models;

- methods;

– industrial samples;

Qualification works:

- dissertations for obtaining the scientific degree of Doctor of Sciences - qualifying works containing new scientific propositions and scientifically based results in a certain field of science, which solve an important scientific or scientific-applied problem and for which the recipient is the subject of copyright;

- theses for obtaining the scientific degree of Doctor of Philosophy - independent detailed studies that offer a solution to an actual scientific task in a certain field of knowledge or on the border of several fields, the results of which constitute an original contribution to the sum of knowledge of the relevant field (fields) and are published in relevant publications;

- master's theses - independently performed theoretical and/or applied research, which is based on a critical analysis and generalization of existing information, conducting own research, carrying out developments and forming applied targeted recommendations.

Publications:

- monographs - scientific publications in the form of a book with an in-depth study of one or several closely related topics;

- scientific articles - scientific publications in periodicals (including those included by the Ministry of Education and Culture of Ukraine in the list of specialists in the relevant field of science), in which research or a group of research related to one topic is described;

- theses - scientific publications in the materials of scientific and practical communicative activities, in which individual main provisions of the results of the conducted research are concisely formulated.

Reports on scientific and scientific research activities of structural units of scientific institutions (educational institutions).

Each type of scientific product must be socially useful.

The scientific product contains not only the actual results of statistical research (parameters of standard deviations or errors, reliability, prevalence, etc.), but also generalizations of the theoretical base according to the researched issues, which, in the end, will become the basis for the formation of the content of the theoretical and conceptual parts of the scientific product, which are devoted to reflecting the essence of the subject of scientific research and developing proposals for improving the situation in this area.

Components of analysis and evaluation of statistical research results:

1. System analysis of the problem and its structuring, determination of the main components and directions of analysis.

2. Criteria for evaluating a scientific product:

– cost-effectiveness – minimization of the cost and amount of resources directed to the activity in view of the appropriate quality of the final product and the determined level of efficiency;

- efficiency - the ratio between the product (goods, services, etc.) and the

resources used for its production;

- balance - presence of certain proportions in balance;

- optimality - a property in which the greatest compliance with the given task, conditions, etc. is ensured;

– rationality – choosing the best options under the available resources and existing conditions;

- effectiveness - the ratio between actual and planned (expected, normative) results.

3. Formation of a list of indicators and a statistical database of development for each of the selected components.

4. Data processing, calculations, analysis and interpretation of the obtained results.

5. Types of probable effect*:*

- *ecological*– changes in the conditions of the natural environment, the quantity and quality of natural resources;

- economic - obtaining additional economic results: growth of national income, labor productivity, resource conservation;

- *scientific and technical*- expansion of knowledge about the surrounding world: discovery of new facts, connections, regularities, discovery of laws, development of new materials, equipment, technologies;

- *political*– changing the conditions for performance of the functions assigned to them by state authorities;

- *social*- changing the content, nature and conditions of work, raising the level and quality of life of the population, raising the general educational and professional level of human resources.

Layout of a scientific productrequires careful and critical evaluation of each of its elements.

Assessment of the layout of a scientific product involves checking:

– the names of the scientific product, its sections and subdivisions in accordance with their content and specialty passport;

– composition of the scientific product, placement of materials and their classification;

- persuasiveness of arguments in defense of the provisions of scientific novelty;

- reliability of conclusions, formulas, tables;

- stylistics of presentation of the material;

- compliance with the requirements for the design of a scientific product.

There are no perfect scientific products, and each has certain flaws that can (indeed, infinitely) be fixed.

2. Requirements for registration of statistical research results

General requirements for the content part.

The text is typed and printed using a computer (preferably in Word 6.0 or later versions) on one or two (optional) sides of a sheet of white A4 paper (210x297 mm) at one and a half line intervals up to thirty lines on a page (approximately 60 characters per line) using standard Times New Roman font size 14. Paper – white, photocopier. Italics, bold italics, and bold fonts are also allowed for highlighting individual places. It is recommended to use appropriate editors when setting formulas and creating tables, diagrams, diagrams, and figures.

The text must be printed on the text field leaving, respectively, fields of the following sizes: left - at least 20-25 mm (35 mm), right - at least 10 mm (15 mm), top and bottom - at least 20 mm (20 mm) .

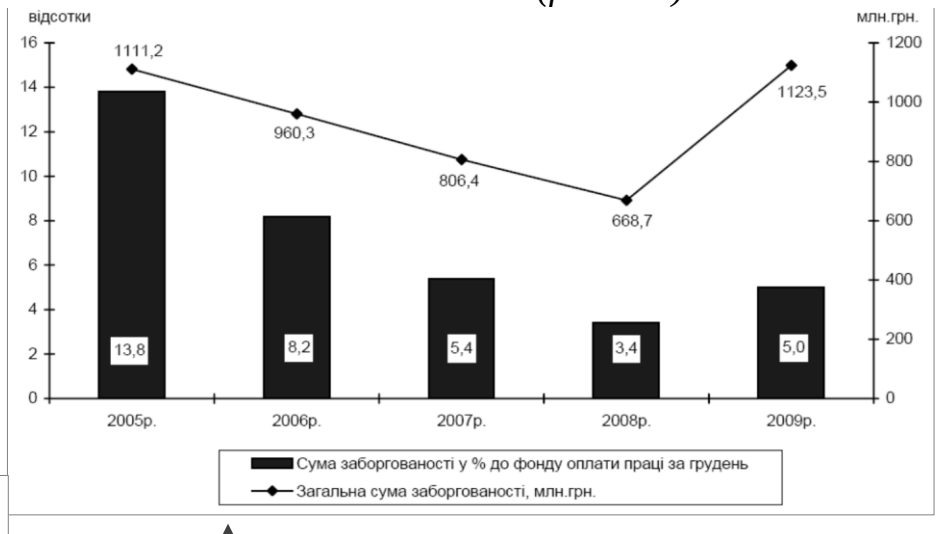
Paragraph indentation should be the same throughout the text and equal to five characters (1.25 cm). The print font should be clear, medium-bold black, the text density should be the same.

Typographical errors, misspellings, and graphic inaccuracies that appeared during the writing of the master's thesis can be corrected by cleaning or painting over with white paint and applying the corrected text (fragment of the drawing) in the same place using a printer or by handwriting.

Requirements for design of illustrations.

Illustrations (drawings, figures, graphs, charts, diagrams, photographs) should be placed immediately after the text, where they are mentioned for the first time, or on the next page. All illustrations must be referenced in the work. The illustration is marked with the word "Figure __", which, together with the name of the illustration, is placed after the explanatory data (for example, "Figure 3.1. Layout scheme"). Illustrations should be numbered with Arabic numerals in sequential numbering within the chapter, except for illustrations given in appendices. The illustration number consists of the section number and the serial number of the illustration, separated by a period (for example, figure 3.2. the second figure of the third section). If the scientific product contains one illustration, it is numbered according to the same rule.

15 mm (free line)



Indent 1.25 cm

15 mm (free line)

Figure 2.2. Dynamics of the amount of arrears from the payment of wages (as of January 1 of the corresponding year) [23]

15 mm (free line)

Only hatched illustrations and original photographs should be used in the scientific product. Photographs smaller than A4 size should be drawn on a standard sheet of white A4 paper. Illustrations must have a title that is placed after the illustration number. If necessary, the illustrations are supplemented with explanatory data (under the pictorial text).

There should be one space before and after the figure (table).

All figures (tables) should be referenced in the text.

The content of figures (tables) should be of the same size (14 or 12 points).

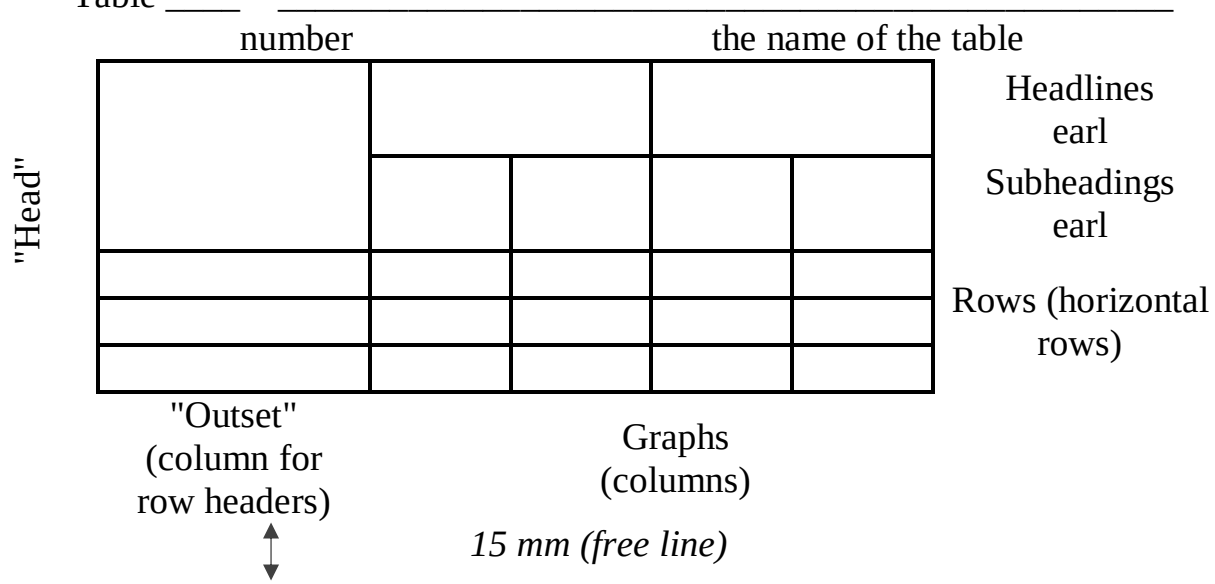
Table design requirements.

Tables should be placed immediately after the text in which they are mentioned for the first time or on the next page.

They should be numbered with Arabic numerals with sequential numbering within the section, except for the tables given in the appendices.

The table number consists of the section number and the serial number of the table, separated by a dot (for example, table 2.1 is the first table of the second section). The table can have a name that is printed in lowercase letters (except for the first capital letter) and placed above the table. The name should be concise and reflect the content of the table. If the rows or columns of the table go beyond the page format, the table is divided into parts, placing one part under the other, or side by side, or transferring part of the table to the next page, repeating its "header" and "sidebar" in each part of the table. When dividing the table into parts, it is allowed to replace its "head" or "side" with numbers of columns or rows, numbering them with Arabic numerals in the first part of the table.

15 mm (free line)



15 mm (free line)

The word "Table __" is indicated once on the left above the first part of the

table, above the other parts it is written: "Continuation of table __" with the table number indicated. Headings of table graphs begin with an uppercase letter, and subheadings - with a lowercase letter, if they form one sentence with the heading. Subheadings that have an independent meaning are capitalized. Do not put periods at the end of headings and subheadings of tables. Graph headings and subheadings are indicated in the singular.

An example of building a table

15 mm (free line)

Table 2.4 – Name of the table

Indexes	Years				
	2013	2014	2015	2016	2017
Indicator					
…					

15 mm (free line)

Requirements for the design of formulas.

In a scientific product, formulas are recommended to be written using standard Microsoft Office mathematical editors or with black ink, ink, or paste on white, opaque paper. Explanations of the values of symbols and numerical coefficients must be given directly below the formula in the sequence in which they are given in the formula. The value of each symbol and numerical coefficient must be entered on a new line. The first line of the explanation begins with the word "de" without a colon.

Equations and formulas should be separated from the text by free lines. Above and below each formula, you must leave at least one free line. If the equation does not fit on one line, it should be moved after the equal sign (=) or after the plus (+), minus (–), multiplication (×) and division (÷) signs.

Requirements for drawing up lists:

The list can be numbered with numbers (with a period or with a parenthesis), letters and markers (horizontal line).

Example of a numbered list:

... the main directions of the state innovation policy include:

1.25 cm

1. Creation of conditions for preservation, development and use of domestic scientific, technical and innovative potential...

0.75

An example of a multilevel list:

Classification of types of economic analysis:

1.25

1. By subjects of analysis:

a) internal analysis - carried out by employees of the company's analytical service.

0.5 cm

An example of a bulleted list:

1.25 By object of investment, investments are:

- real - investment in real assets: tangible and intangible (innovative investments); …

Requirements for creating links:

When designing a scientific product, references should be made to sources, materials or separate data, ideas and conclusions, on the basis of which the problems, tasks, and questions that the study is devoted to are developed. Such links make it possible to find documents and check the reliability of information about cited documents, as well as help to find out its content, language of the text, volume. Reference should be made to the latest editions of publications. Earlier editions may be referred to only where they contain material not included in the latest edition. References in the text of the dissertation to sources should be marked with a serial number following their list, separated by two square brackets (for example: "... in works [1-7]..."; "... in works [1; 7; 23] ...").

If information, materials from monographs, review articles, other sources with a large number of pages are used, then in the reference it is necessary to accurately indicate the numbers of pages, illustrations, tables, formulas from the source to which the reference is given in the dissertation (for example: "... in the monograph [7, p. 48]...").

References to illustrations in the dissertation are indicated by the serial number of the illustration (for example: "Fig. 1.2"). References to formulas are indicated by the serial number of the formula in parentheses (for example: "... in formula (2.1)").

All tables of the thesis must be referenced by its text; at the same time, the word "table" is written abbreviated in the text (for example: "...in table 1.2"). In repeated references to tables and illustrations, the abbreviated word "see" should be indicated (for example: "see table 1.3"; "see fig. 2.1").

In the case of using borrowed material (quotes, tables, figures) without references to the author and the source, the thesis will be withdrawn from consideration without the right to defend it again.

Requirements for the style of presentation of materials:

- adhere to the scientific style of presentation of the material - an impersonal monologue (the presentation is spoken from the third person), since attention is focused on the content and logical sequence of the message, and not on the subject;

- to ensure the accessibility and comprehensibility of the content of the dissertation, thanks to which its text is easy to read, and the expressed thoughts are

perceived without complications (the need for additional comments of the applicant);

- express authorship through "we", which indicates a collective expression of opinion, i.e. the position of the recipient is shared by his scientific supervisor/consultant;

- distinguish between own and borrowed material stylistically; pay special attention not only to presenting arguments regarding scientific novelty, but also to its clear formulation both in the introduction of the dissertation and in its actual test;

- highlight quotations with quotation marks (... "..." [17, p. 15] ...), and if necessary, indicate their author(s), giving his/her initials and last name(s) (for example, according to O. Markiv ...; according to O. Markiv...; according to O. Markiv...);

- observe the rules of spelling, grammar and punctuation inherent in the Ukrainian business language;

- use scientific vocabulary to ensure the semantic completeness, integrity and coherence of the scientific text, as well as special marker words that structure the text well, helping to turn it into a scientific one; avoid journalistic style, jargon, as well as unnecessary repetitions and excessive detail; limit the use of foreign words, if there are Ukrainian equivalents;

- use special terms that allow you to concisely give a detailed description of scientific facts, processes, phenomena; at the same time, give preference only to those concepts that directly relate to the object of research, and are not tangential to it;

- periodically reread the text in order to find better sentence constructions, more accurate statements, more accurate meanings, more appropriate interpretations, as well as avoiding unjustified repetitions.

Requirements for drawing up a list of used sources:

Currently, in accordance with the normative documents of the Ministry of Education and Culture of Ukraine, the list of literary sources can be drawn up either in accordance with the National Standard of Ukraine "Information and documentation. Bibliographic references. General provisions and rules of compilation. DSTU 8302:2015" or one of the styles included in the recommended list of styles of design of the list of scientific publications, which are commonly used in the foreign practice of design of scientific works. The use of the requirements of the specified standard is more widespread.

According to the standard, the literature is presented in alphabetical order by the surnames of the first authors. Information about the sources included in the list must be given in accordance with the requirements of the state standard, with mandatory indication of the titles of the works and original data of the publishing houses.

Examples of bibliographic entries in the list of used sources:

One author

O.A. Melnychenko Management of structural changes: a textbook. Kharkiv: Oberig, 2013. 300 p.

Two or more authors

Melnychenko O.A., Shvedun V.O. Peculiarities of the development of the tourism industry in Ukraine: monograph. Kharkiv: NUTSZU Publishing House, 2017. 153 p.

Without an author

Management for masters: study guide / [col. author]; in general ed. MA. Latin Kharkiv: Publishing House of KhaRI NADU "Master", 2017. 500 p.

Multivolume document

Kucheryavenko N. P. State regulation of the economy: The state and the market: in 6 vols. Kharkiv: Pravo, 2007. Vol. 4: Methods of state regulation of the economy. 534 p.

Dictionaries

State administration and public service: dictionary-reference / [auth.-uklad. O. Yu. Obolensky]. Kyiv: KNEU Publishing House, 2005. 480 p.

Dissertations

O.A. Melnychenko State policy on raising the level and quality of life of the population:thesis ... d.derzh.upr.: spec. 25.00.02. Zaporizhzhia, 2010. 448 p.

Dissertation abstracts

O.A. Melnychenko State policy on raising the level and quality of life of the population: autoref.thesis ... d.derzh.upr.: spec. 25.00.02. Zaporizhzhia, 2010. 36 p.

Abstracts, reports from conference materials, round tables

Melnychenko O.A., Radkova O.S. Institutional support of public management of solid household waste management in Ukraine. Economy and Society: a Modern Foundation For Human Development: II International Scientific Conference, June 23th, 2017. Leipzig, Germany: Baltija Publishing, 2017. Part 1. P. 75–78.

Part of a book, periodical, continuing publication

O.A. Melnychenko Transition to higher technological systems: the priority direction of the development of the Ukrainian economy. State regulation of innovative development of economic sectors in the conditions of globalization: strategic priorities: monograph / [col. author]; in general ed. MA. Latin Kharkiv: KhaRI NADU Publishing House "Master", 2014. P. 13–22.

Electronic resources

O.A. Melnychenko Elements of state environmental policy. State construction. 2016. No. 2. URL: http://www.kbuapa.kharkov.ua/e-book/db/2016-2/doc/1/01.pdf (access date: 07/15/2017).

Legislative and regulatory documents

Constitution of Ukraine: Adopted at the fifth session of the Verkhovna Rada of Ukraine on June 28, 1996. Kyiv: Publishing House of the Verkhovna Rada of Ukraine, 1996. 15 p.

Preprints

Panasiuk M.I., Skorbun A.D., Sploshnoi B.M. On the accuracy of determining

the activity of solid radioactive waste by gamma methods. Chernobyl: Institute of Prob. of NPP safety of the National Academy of Sciences of Ukraine, 2006. 7, [1] p. (Preprint. NAS of Ukraine, Institute of NPP Safety Problems; 06-1).

Standards

DSTU 7152:2010. Edition. Designing publications in magazines and collections. [Effective from 2010-02-18]. Kind. officer Kyiv, 2010. 16 p. (Information and documentation).

Patents

Luminescent material: pat. 25742 Ukraine: МПК6 C09K11/00, G01T1/28, G 21H3/00. No. 200701472; statement 12.02.07; published 27.08.07, Bul. No. 13. 4 p.

Archive documents

Scientific Society named after Shevchenko. Lviv. of science b-ka named after V. Stefanyka of the National Academy of Sciences of Ukraine. F. 1. Op. 1. Ref. 78. Ark. 1–7.

Bibliographic indexes

Lysodyed O.V. Bibliographic guide to criminology (1992–2002) / edited by O.H. Kalman. Kharkiv: Odyssey, 2003. 128 p.

Catalogs

Historical and legal heritage of Ukraine: cat. ext. / comp.: L.I. Romanova, O.V. Zemlyanishchyna Kharkiv, 1996. 64 p.

Adherence to the recommendations for the design of a scientific product improves the perception of its content.

3. Scientific publications as a form of publicizing the results of statistical research

Recommendations for preparing publications:

1. A certain period of time (from several weeks to a year or more) is always required for posting the results of scientific research.

2. In one issue (number) of a scientific publication, there should be no more than one article of the recipient on the topic of scientific research.

3. Publication of the results, on the one hand, ensures compliance with the relevant formal requirements and gives priority to authorship, but on the other hand, it creates a number of potential problems:

– scientific ideas can be refined and/or taken as a basis and put forward for defense within someone else's dissertation research;

– the materials contain provisions that turned out to be incorrect and/or require clarification (the marked forces the scientist to correct his mistakes, but it is still better than "going on the defense" with existing shortcomings).

General requirements for publishing publications:

1. Such information may vary to some extent, depending on the status, geography and traditions of publications. If necessary, the necessary information can be clarified on the websites of relevant scientific publications and organizers of communication events, as well as in printed requirements for printing and invitations

to participate in such events.

2. Main parameters:

– paper size A4 (210×297 mm);

– text indents from its margin: left – 35 mm (20 mm or more), right – 15 mm (10 mm or more), top and bottom – 20 mm (10 mm or more);

– font – Times New Roman (Arial…), size – 14 (12; 10), paragraph – 1.25 (1.00), line spacing – one and a half (single).

3. Structural elements:

– UDC – should indicate the issue (title) of the publication;

- information about the author - surname, first name and patronymic; academic degree, academic title; position, institution (facility) where he works;

– the name of the publication – accurately reflects its content;

– abstract – 3–5 sentences that succinctly reflect the main results of the research and are consistent with its tasks (goals);

– keywords – 5–8 words with which this research is identified, and by which this publication will then be searched;

- statement of the problem in a general form and its connection with important scientific or practical tasks (0.5-2.0 pages) - the relevance of the problem, which is the subject of this publication, is proved;

- an analysis of the latest research and publications in which the solution to this problem was initiated and on which the author relies (0.5-1.0 pages) - a brief overview of scientific assets containing dissertations, monographs and scientific articles on this issue for the last a period of time (3–5 years or more);

– formulation of publication goals (task setting) (3–5 tasks);

– presentation of the main material of the research (5–8 pages) – a full justification of the obtained scientific results and a clear formulation of their scientific novelty and practical significance;

– conclusions from this study and prospects for further research in this direction (0.5–2.0 pages);

- a list of used sources (3 or more names; links to own publications only if urgently needed).

Individual scientific publications can be both specialized in several fields of science, and those that are indexed in international scientific and metric databases (Scopus, Web of Science)

Criteria for selecting scientific publications:

- belonging to the field of science (according to the decision of the Ministry of Education and Culture of Ukraine), within which scientific research is carried out;

- registration requirements;

– list of accompanying documents;

– the complexity of the procedure for accepting materials for publication;

– cost and speed of publication;

- geography of publication, etc.

Procedure for preparation of scientific articles:

– awareness of the necessity and/or need for a scientific article;

- selection of a scientific publication;

- formulation of the title of the scientific article and the list of problems to be solved by it;

- collection, processing and analysis of information related to the object of research;

– summarizing and design of research results in the form of a scientific article;

– editing and correction of materials;

- compliance with deadlines for sending materials to publishing houses;

- receiving confirmation of acceptance of materials for publication;

- payment of the organizational fee and sending a photocopy of the check for its payment;

- receiving a publication with the recipient's article.

Recommendations for the preparation of scientific articles:

- the material must meet the goals and objectives of the scientific publication, as well as be interesting for its readers;

– the article was not submitted for publication in other scientific publications;

- strict adherence to technical parameters (font, size, margins);

– logical, structured and literate presentation of the material;

– readability and clarity of illustrative materials;

– presence and correct sequence of structural elements;

– use of current links to publications of recent years;

- absence of plagiarism (you cannot use quotes or illustrations without the permission of the copyright holder and without references to the original source);

- display of the results of a full-fledged study (the article should not be an extended version of other scientific works, or a part of a larger study that was divided into several parts (material for separate publications));

- the presence of a clearly formulated and substantiated scientific novelty; the article must be a certain contribution to the development of science;

– use of generally accepted methods of scientific research;

– identification of specific groups of research subjects and parameters of their comparison;

– the analysis must be based on an appropriate statistical base;

– logicality and structure of the conclusions (arguments in the article must take into account a significant body of scientific literature on the topic of the article, and must also confirm and substantiate the conclusions).

Individual (insignificant in scope) results of statistical research can be presented in the form of theses of reports for a communicative event, the subject of which corresponds to the problems of scientific research.

Criteria for choosing scientific communicative activities:

– compliance of the name of the event (its section) with the topic of the research;

- the presence of well-known scientists - experts on the researched issues;

– convenient date, venue and transfer;

- acceptable cost of participation, accommodation, travel, etc.

Procedure for theses preparation:

– awareness of the need and personal need to participate in a communicative event;

- selection of a communicative event;

- formulation of the title of theses and the problem to be solved;

- collection, processing and analysis of information related to the object of research;

– summarizing and design of research results in the form of theses;

– editing and correction of materials;

– filling out an application for participation in communication events;

- compliance with the deadlines for sending applications for participation and theses of the report;

- receiving confirmation of acceptance of materials for publication;

- payment of the organizational fee and sending a photocopy of the check certifying this;

– ticket purchase, hotel reservation;

- preparation of the text and presentation of the report;

- participation in a communicative event and/or receiving a collection of its materials.

V. Materials for self-control:

AND. Questions for self-control:

B. Test tasks and problems

INDEPENDENT WORK

Tasks for solution/discussion:

1. Choose the form of publishing your own scientific (statistical) research.
2. Prove the correctness of the choice of theoretical and analytical information as the starting base for formulating conclusions based on the research results.
3. Justify your proposed recommendations for improving the situation in the research area.
4. Create (according to current requirements) own scientific product.
5. Based on the results of own scientific (statistical) research, prepare a scientific article for a professional publication.
6. Based on the results of one's own scientific (statistical) research, prepare abstracts of reports and their presentation for a professional communicative event.

Summing up.

List of recommended literature

Main:

1. Gutorov O.I. Methodology and organization of scientific research: study guide. Kharkiv: KHNAU, 2017. 272 p.
2. Danilyan O.G., Dzoban O.P. Organization and methodology of scientific research: teaching. manual Kharkiv: Pravo, 2017. 448 p.

3. Degtyarev A.V., Kokodiy M.G., Maslov V.O. Fundamentals of scientific research: a study guide. Kharkiv: KHNU named after V. N. Karazina, 2016. 78 p.
4. Kostyukevich V.M., Konnova M.V. Methodology of scientific research: study guide. Vinnitsa. 2017. Vol. 172.
5. Malyhina V.D. Methodology of scientific research. Rivne. 2016. 247 p.
6. Methodology of scientific research: teaching manual. / V.I. Zatserkovnyi, I.V. Tishaev, V.K. Demidov – Nizhyn: NSU named after M. Gogol, 2017. – 236 p.
7. Methodology of scientific research in medicine: teaching. manual / V.D. Babajan, N.S. Bakumenko, O.I. Kadykova and others; under the editorship P.G. Kravchuna, V.D. Babajana, V.V. Meat eater. – Kharkiv: KhNMU, 2020. – 260 p.

Additional:

1. Puzanova O. G. Information provision of evidence-based health care. Part I. / O. G. Puzanova, T. S. Gruzheva // Proof. honey. – 2014. – No. 4 (16). - P. 23-33.
2. Skakun M. P. Fundamentals of evidence-based medicine: monograph / M. P. Skakun. - Ternopil: Ukrmedknyga, 2005. - 244 p.
3. Chernobrovy V. M. Health, pre-disease, disease: medical and social aspects and assessment. Risk factors. Preventive medicine: a guide for graduate students, interns, general practitioners - family medicine / V. M. Chernobrovyi, S. G. Melashchenko, T. M. Tkachuk. – Vinnytsia: Planer, 2013. – 80 p.
4. Shulyak V. I. International experience of using an integrated clinical protocol in medical practice (literature review) / V. I. Shulyak // Ukr. honey. magazine – 2010. – No. 5 (79). - P. 41-44.
5. Howick J. The Philosophy of Evidence-Based Medicine / J. Howick. - Oxford: Blackwell-Wiley, 2011. - 238p.

Electronic information resources:

1. Best Evidence. URL: http://www.bestevidence.com/
2. BritishMedicalJournal. url http://www.bmj.com/specialties/evidence-based-practice
3. CanadianMedicalAssociation. URL: http://www.cma.ca/
4. Center for Evidence-based Medicine at the University of Oxford. URL: http://www.cebm.net/
5. Clinical Evidence. URL: http://clinicalevidence.bmj.com/x/index.html
6. Cochrane Collaboration open learning material for reviewers. URL: http://www.cochrane-net.org/openlearning
7. Cochrane Library. URL: http://www.thecochranelibrary.com/
8. Current Controlled Trials. URL: http://www.controlled-trials.com/mrct
9. eGuidelines. URL: http://www.eguidelines.co.uk/
10. Evidence-Based Medicine. URL: http://ebm.bmj.com/
11. Canada Clinical Guidelines Database. URL: http://www.phac-aspc.gc.ca/

12. JAMAEvidence. URL: http://www.jamaevidence.com/
13. Medscape. URL: http://www.medscape.com/
14. National Institute for Clinical Excellence. URL: http://www.nice.org.uk/
15. PRODIGY (Clinical Guidance). URL: http://prodigy.clarity.co.uk/

Practical lesson No. 10

TOPIC:"Structure and design of an essay, thesis" - 2 hours

Goal:familiarization with the order of preparation and defense of theses

- –familiarization with the purpose, tasks, main stages of implementation and requirements for the thesis;
- –reveal the content and scope of the thesis, as well as the main requirements for its preparation;
- –to consider the organization of thesis management, the procedures for obtaininginvention of the scientific supervisor and external review;
- –characterize the process of preparation for the defense and defense of the thesis

Basic concepts:

Term	Definition
Conclusion	- a final opinion about something, a logical conclusion made on the basis of observations, reasoning or consideration of certain facts.
State Examination Commission	–commission created forchecking and evaluating the scientific, theoretical and practical training of students who graduate from a higher educational institution, in order to establish the compliance of their educational and qualification levels with the requirements of the education quality standard.
Graduate work	–this is a written presentation of the results of research of a scientific, analytical nature, which is based on a critical review of bibliographic sources.
Research tasks	-these are the questions that must be answered in order to realize the purpose of the study.
Illustration	- an image that accompanies, complements and visually explains the text (drawing, diagram, graph, diagram, etc.).
The aim of the study	-the expected final result, which determines the general focus of the research.
Object of study	-a fragment of reality to which the cognitive activity of the researcher is directed (material or ideal system).
Subject of study	-processes and phenomena within the selected object (structure of the system, patterns of interaction of elements within the system, patterns of development, properties of the system, etc.).
Review	- an official written response,which contains critical analysis and evaluation of scientific work.
Table	is a method of rational, compact, visual presentation of systematized information about the researched object in digital form and in a certain order of placement.

Actuality of theme

The thesis is the final result of the independent individual educational activity

of the cadet (student), a scientific study that summarizes the results of his study of the disciplines provided for in the training plan and the completion of all educational and industrial practices.

A cadet (student)-diploma must confirm the level of general theoretical and special training. The thesis is a graduation qualification thesis, based on its defense and successful passing of the comprehensive exam in the specialty, the State Examination Commission decides on the assignment of the qualification of manager-economist to its author and the issuance of a specialist diploma.

Plan

I. Organizational moment (greetings, checking those present, announcing the topic, the purpose of the lesson, motivating students to study the topic).

II. Control of basic knowledge: Theoretical questions for the lesson:

III. Formation of professional skills and abilities. Practical works (tasks) performed in class:

- Description of the process;
- Registration of results;
- Enforcement and protection.

Topic content:

PURPOSE AND OBJECTIVES OF THE THESIS

Completion and defense of a diploma thesis, along with taking a comprehensive state exam, is the final stage of education at a higher educational institution, a form of state certification of graduates.

The thesis is the final result of the independent individual educational activity of the cadet (student), a scientific study that summarizes the results of his study of the disciplines provided for in the training plan and the completion of all educational and industrial practices.

A cadet (student)-diploma must confirm the level of general theoretical and special training. The thesis is a graduation qualification thesis, based on its defense and successful passing of the comprehensive exam in the specialty, the State Examination Commission decides on the assignment of the qualification of manager-economist to its author and the issuance of a specialist diploma.

The purpose of the diploma researchis the solution of a professional problem, which is based on the comprehensive mastery of research material and methods, consistent teaching, as well as the practical application of theoretical knowledge to solve specific tasks related to improving the management of the enterprise's activities.

In the process of completing the diploma work, the cadet or trainee must demonstrate:

- knowledge of general theoretical, general economic, professionally oriented and special disciplines that reveal the theoretical foundations and practical issues of management;

- the ability to select, systematize and process information in accordance with the research objectives;

- the ability to develop scientific conclusions and specific proposals for improving the management of a real research object;

- the ability to determine and use cause-and-effect relationships of processes and phenomena in the applied field.

THE MAIN STAGES OF PERFORMING THE THESIS

The diploma work is performed on the basis of an in-depth study of the current legislation of Ukraine on the activities of enterprises and organizations, special domestic and foreign literature, best practices on the problem being studied, as well as the results of the cadet's or trainee's own research of a real object.

The preparation of the thesis involves the following main stages of implementation:

1. Choosing the direction and topic of research, submitting the appropriate report and approving the topic.
2. Determination of the object, subject, goal and tasks of the research, approval of the individual task for the thesis.
3. Processing of sources of secondary information, formation of the general concept of research, methodical approaches and tools, preparation of the working plan of the thesis.
4. Formation of the theoretical and methodological foundations of the problem under investigation, generalization of existing concepts, study of the evolution of approaches to solving the problem, systematization of modern views of domestic and foreign scientists.
5. Collection of actual material during pre-diploma practice at the object of research, economic diagnosis of the object of research, in-depth analysis and evaluation of indicators characterizing the subject of research.
6. Justification of directions for solving the problem under investigation, search for means of overcoming obstacles to their implementation, economic justification of the feasibility of implementation.
7. Analysis of the state of labor protection or working conditions at the research facility, development of effective measures to improve them.
8. Presentation of the results of the diploma research in text form, preparation of the introduction, conclusions, appendices, arrangement of the list of used sources.
9. Completion of the thesis.

10. Obtaining admission to the thesis for defense at the graduating department.
11. External review of the thesis.
12. Preparation for defense.
13. Defense of the thesis at the State Examination Commission.

Cadets (students) who have successfully passed the credit-examination session, completed industrial and pre-diploma practice and defended their reports are allowed to complete the thesis.

THESIS REQUIREMENTS

The thesis should be characterized by logic, evidence, argumentation and contain:

- in-depth comprehensive analysis of the level of coverage of the problem under investigation in the scientific literature;
- elements of independent research, economic analysis of the object and subject of research, performed with the help of a computer;
- substantiated proposals for improving the operation of the facility under investigation and the state of labor protection or working conditions there.

The thesis must have the proper design and all the necessary supporting documents (completed assignment form, information card, abstract, review of the scientific supervisor, conclusion of the graduating department regarding the admission of the work to the defense, review of the external reviewer). If desired, the cadet or student can receive an additional feedback on the thesis from the enterprise or organization that is the customer of the research. The work must be completed and submitted to the graduating department within the time limit provided by the schedule of the educational process.

A diploma thesis that does not meet the requirements for content and design, the approved topic, is written without following the approved plan, does not contain a theoretical and methodological part, economic calculations, an analysis of the state of labor protection and working conditions, substantiated proposals, and also does not have an external review, to protection is not allowed.

SELECTION OF FIELD AND APPROVAL OF THE THESIS TOPIC

A cadet or trainee is given the right to independently choose the direction of research work. It is appropriate if the latter was developed earlier during the preparation of term papers, abstracts, reports at scientific and practical conferences, etc.

The subject of the thesis is chosen by the cadet or trainee in accordance with the recommended topic. After choosing a topic, the cadet or trainee submits a report to the head of the graduating Department of Management and Economics.

The recommended topic of diploma theses is developed by the graduating department of management and economics in accordance with the requirements of

the variable component of the educational and qualification characteristics of specialists in accordance with the approved programs of the studied normative and selective disciplines, reflecting the current issues of modern management. The topics of diploma theses are reviewed and updated annually.

According to the thesis topic chosen by the cadet or trainee, the graduating Department of Management and Economics appoints a scientific supervisor who provides scientific and methodological assistance to the cadet or trainee in his independent work on the thesis. At the same time, as a rule, the wishes of cadets (students) and academic supervisors are taken into account.

Upon prior agreement with the head of the Department of Management and Economics, a cadet or trainee may propose his research topic. To do this, it is necessary to justify in writing the feasibility of its development (in accordance with the previous own research work, the place of work, the possibility of obtaining the necessary information at the research object). In addition, diploma theses can be performed on a topic that will be ordered by enterprises and organizations of the aviation (tourist) profile.

Within one month from the submission of the application for approval of the topic, the cadet or trainee, in agreement with the academic supervisor, has the right to replace the topic or clarify it. To change (clarify) the topic, you must submit an application to the head of the graduating department with the signature of the cadet (student) and his supervisor.

After the final agreement with academic supervisors, theses topics are considered and discussed at a meeting of the graduating department of management and economics and approved by an order of the academy. Further changes and clarification of topics are possible only in extreme circumstances, they require substantive justification and an additional order at the written request of the department (excerpt from the minutes of the meeting). Circumstances that may become the basis for such a request are, for example, the stay of a cadet or listener in a hospital or a long-term business trip, which must be confirmed by relevant documents.

DETERMINATION OF THE OBJECT AND SUBJECT OF THE THESIS, DRAWING UP THE RESEARCH WORK PLAN

Object, on the basis of which the work will be carried out, is an organization of any form of ownership, which is a legal entity, has independent reporting and is engaged in foreign economic activity (FET). The object of diploma research is the basis of pre-diploma practice.

It is desirable to develop a topic to the order of the organization's management. This order is issued by an order letter

The topic of the thesis (subject of research) is one of the urgent problems of

modern management, which corresponds to the tasks and skills provided by the variable component of the specialist's educational and qualification characteristics

After the final determination of the topic, object and subject of the research, the cadet or trainee fills out the task form with the help of the scientific supervisor. The task is signed by the cadet (student) and the supervisor, and also approved by the head of the graduating department of management and economics.

With the help of the supervisor, based on the topic, goal, object and subject of the research, the cadet or student prepares a draft plan (work plan) of the thesis. The plan should include questions that reveal the content of the topic.

CONTENT AND SCOPE OF THE THESIS

The thesis of a specialist should have a volume of 110-130 pages of printed text (not including the "List of used sources" and "Appendices").

The content of the thesis is determined by its topic and is reflected in the plan developed with the help of the supervisor. The thesis must contain:

- title page;
- content;
- a list of conditional abbreviations (if necessary);
- introduction;
- the main part;
- conclusions;
- references;
- applications (if necessary).

Title page contains the name of the higher educational institution, surname, first name and patronymic and other information about the author, the topic of the thesis with reference to the object of research, surname, academic title (position) of the scientific supervisor, city and year. The completed and properly executed thesis must be signed by the author and supervisor on the title page.

Content contains the names and numbers of the initial pages of the introduction, all chapters and subsections, conclusions, a list of used sources, appendices.

List of conventional abbreviations.If specific terminology or little-known abbreviations, new symbols, designations, etc. are used in the thesis, then their list should be submitted in the form of a separate list, which is placed before the introduction. The list should be printed in two columns, in which abbreviations are given on the left of the alphabet, and on the right - their transcription. Regardless of this, for the first appearance of these elements in the text of the thesis, their transcription is given.

Introduction reveals the essence of the diploma research problem, the grounds and initial data for the development of the topic, justification of the need for

research. The introduction reflects:

- **Actuality of theme**(a brief description of the state of the problem under investigation is presented, the expediency of developing a topic for the development of the aviation (tourism) industry as a whole or its individual component is substantiated; as a rule, they provide a list of leading domestic and foreign scientists studying the problem);

- **the purpose and tasks of the work**(the goal, as a rule, is closely intertwined with the topic of the work; solving problems allows the researcher to achieve the goal);

- **object of study**(a brief description of the enterprise or organization in the aviation (tourism) industry is provided: ownership, organizational and legal form, branch affiliation, when and by whom it was founded, location, material and technical base (description of premises, warehouses, transport, etc., valuation), main economic indicators for reporting period, number of employees, diagram of the structure of the management apparatus with commentary, list of main competitors. If the object of the diploma research is the market of international aviation (tourist) services, a brief description of the region, on the materials of which the work is being carried out, is provided);

- **subject**research(the aspect of management that is subject to research within the defined object is determined);

- **research methods**(a list of scientific research methods that were used in the work is provided);

- **theoretical and methodological basis of research**(a generalized list of sources of information that are the basis of the study is provided);

- **practical significance of the obtained results**(indicate where and how the results of the diploma research can be used);

- **structure of work**(indicate the total scope of work, structure, number of tables, figures and appendices).

The length of the introduction should not exceed 4-5 pages.

Main partthesis consists of four sections: theoretical-methodological, analytical, development-implementation and labor protection. Within each section, three subsections are allocated, which should reflect the logical sequence of research and development of own proposals. At the end of each section, conclusions are presented with a concise statement of the scientific and practical results presented in the section.

The first chapter- theoretical - contains three subdivisions:

Chapter 1. Scientific and methodological principles ... (the subject of the research – problems of industry management)

1.1. Theoretical foundations of ... (subject of research)

1.2. Organizational and methodological aspects ... (of the research subject)

1.3. Features / specifics (of the research subject in the sectoral aspect)

The theoretical justification should determine the role and place of the studied phenomena and processes in the activity of the enterprise or organization. This section substantiates the theoretical basis of the chosen problem, provides an overview of literary sources, new developments, published statistical data with reference to sources, and other information related to the topic. Based on the study of scientific, educational and methodological literature, the approaches of different authors to solving the problem are revealed, it is shown what is the similarity and what is the difference between their views, and also their own views on the problem are substantiated.

This section provides an assessment of the current laws, resolutions, decrees and other official administrative documents, regulatory and reference base for the investigated problem. The actual understanding of this base is revealed, the necessity and expediency of individual documents are substantiated.

Theoretical justification, essence, meaning, classification characteristics, history and modern trends of the subject of research, methodological approaches should have certain elements of polemics, affirmed own position regarding the chosen research methods, which makes it possible to move in the next section to a specific analytical study.

It is desirable to illustrate the text with graphic materials and diagrams, graphs, charts, etc.

The recommended volume of the first chapter is 25-30 pages.

The second section- analytical - contains three subdivisions:

Chapter 2. Analysis of activity ... (object of research and subject of research)

2.1. Organizational and economic characteristics ... (of the research object)

2.2. Analysis of financial and economic activity ... (object of research)

2.3. Research / assessment of ... (subject of research at the research object) and its impact on the efficiency of economic activity ... (of the research object)

The analytical section, ensuring the logical sequence of the research, should become a transition to the next third section and combine the acquired theoretical knowledge and the ability to use the selected methods and a certain methodical toolkit.

This section provides a description of the research object, a description of the current state of the research topic at the research object, a diagnosis of the activity of

the enterprise or organization in relation to the chosen research direction, a thorough analysis using the accumulated factual material and with the involvement of all theoretical knowledge, a certain methodological toolkit is carried out. The analysis must necessarily correspond to the methodological material disclosed in the previous section.

All analytical calculations, tables, graphs, diagrams must be accompanied by interpretation and conclusions that allow to determine the essence of management processes, their features, trends, create a base for identifying unused reserves.

The analysis of the problem should be carried out taking into account the factors of positive and negative actions.

The text should be illustrated with real documents given in the appendices, which must be accompanied by a brief comment.

To complete the second section, the cadet (student) must collect factual data during pre-diploma practice. The source of information is planned and actual indicators of economic activity, statistical and accounting reports, orders, orders, results of observations, surveys and surveys and other methods of collecting primary information.

Of particular importance is the correct summarization of accumulated factual material, grouping and processing of data, on the basis of which a qualified analysis is carried out, proposals are substantiated.

In order to maintain the acquired skills of working on a personal computer and the skills of algorithmization and programming, each cadet (student) must use a computer in the diploma work.

When describing this stage of work, it should be noted:

- the assigned task;
- the program by which it will be decided;
- database (it is necessary to provide real documents in the application that are sources of primary information - balance sheet, other forms of reporting);
- calculation formulas;
- block diagram of the problem solving algorithm;
- the result - in the form of a summary table, diagrams, graphs, etc.;
- analytical description of the result.

The recommended volume of the second chapter is 25-30 pages.

The third section–advisory - contains three subsections:

Section 3. Improvement / increase in efficiency ... (of the research subject at the research object)

3.1. Ways / directions / recommendations ... (improvement of the research subject at the research object)

3.2. Implementation / implementation of ... (recommendations regarding the improvement of the research subject at the research facility)

3.3. Improvement effectiveness (of the research subject at the research facility)

The task of the third section is to develop specific recommendations, proposals, models for managing the parameters of development and activity of an enterprise or organization on the basis of the main theoretical provisions, methodological approaches, methodological tools outlined in the first section, as well as the conclusions of the research conducted in the second section.

This part provides the rationale for measures to improve the facility's operations. The system of measures logically follows from the theoretical and analytical parts and is aimed at overcoming contradictions between the real and desired states of the object, taking into account individual tasks, that is, specific measures (proposals, recommendations, etc.) of the cadet (student)-graduate should be aimed at ensuring indicators of economic growth.

Detailed proposals for improving the activity of the enterprise or organization must correspond to the direction of the research, each with a detailed rationale, in connection with and as a result of the conclusions from the analysis conducted in the second chapter, based on the identified deviations, problems and shortcomings.

The practical value of proposals and recommendations must be confirmed by technical and economic calculations and determination of the effect expected from implementation.

It is possible to use a personal computer in the calculations for substantiation of proposals.

The recommended volume of the third chapter is 25-30 pages.

The fourth chapter- Occupational Health- contains three subdivisions:

Section 4. Improvement of the state of labor protection / working conditions ... (when improving the subject of research at the research object)

4.1. Analysis of the state of labor protection / working conditions on ... (object of research)

4.2. Recommendations for improving the state of labor protection / working conditions ... (when improving the research subject at the research facility)

4.3. Socio-economic effectiveness of the implementation of measures to improve the state of labor protection / working conditions ... (when improving the subject of research at the research object)

The fourth section should be organically related to the topic of the thesis. Its purpose is to improve working conditions as a result of solving management problems at the object of the thesis - an enterprise in the aviation (tourism) industry

or in its structural unit.

The results of the implementation of the fourth section should be: general tasks in the field of labor protection; analysis of the organization of the labor protection service, the general condition and causes of industrial injuries and morbidity, the main possible dangerous and harmful production factors that are present at the object of the diploma research, the state of working conditions; developed recommendations for improving working conditions, presented well-founded decisions, projects (programs) for their implementation and relevant measures; determined social and economic efficiency from their implementation.

Taking into account the specifics of the completion of diploma theses in the field of "Management", the fourth section can be presented in two versions:

1. In diploma theses, in which the object of research is the enterprise as a whole, based on general tasks in the field of labor protection, a general analysis of the organization and the state of labor protection in the industry / at the enterprise is carried out, possible dangerous and harmful production factors are identified, recommendations are developed for improving conditions and labor protection in general and for improving the subject of research, in particular, as well as determining social and economic efficiency from the implementation of the relevant proposed measures.

2. In diploma theses, in which the subject of research is management problems in a certain structural division of the enterprise and, based on general tasks in the field of labor protection, an analysis of working conditions in the corresponding structural division is carried out, recommendations are developed for improving working conditions in general and for improving the subject of research , in particular, and also determine the social and economic efficiency of the implementation of the relevant proposed measures.

The recommended volume of the fourth chapter is 25-30 pages.

Conclusions, given in a separate section of the thesis, is a concise summary of the results of the conducted research. It is here that the most important theoretical provisions are briefly presented, which contain the formulation of the solved problem, the evaluation of the research results from the point of view of compliance with the purpose of the thesis and the tasks set in the introduction, proposals for improving the researched area of activity of the enterprise or organization, which were substantiated in detail in the third chapter , as well as measures to improve working conditions.

The volume of conclusions should not exceed 5-6 pages.

references (at least 50 items) must contain all information sources that were used by the cadet (student) in the research process, in the following sequence.

and) Laws of Ukraine (in chronological order);

b) presidential decrees, government resolutions (in chronological order);

in) directive materials of the ministries (in chronological order);

d) monographs, brochures, textbooks (alphabetical order);

e) magazine articles (alphabetical order);

is) instructional, regulatory and other materials used by the enterprise (alphabetical order);

g) foreign language sources;

h) electronic sources.

Appendicesmust contain informational materials that form the basis of analytical research according to the chosen topic: the charter of the enterprise; regulations on functional divisions; job instructions of specialists; staff schedule; forms of accounting and statistical reporting (No. 1 "Balance", No. 2 "Report on financial results", No. 1-PV "Work report", No. 3-PV "Report on the use of working time", etc.); contracts with suppliers; advertising materials; organizational and administrative documents: orders, orders, instructions.

In addition, it is advisable to include in the appendices the auxiliary material necessary for the completeness of the perception of the thesis: intermediate mathematical proofs, formulas, calculations; tables of auxiliary digital data; instructions, methods, description of algorithms and programs for solving problems on a computer, developed in the course of the thesis; illustrations of an auxiliary nature.

Mandatory references must be made to all appendices in the main text of the paper.

For example, we will give an approximate plan of the thesis on the topic "Increasing the efficiency of the management of innovative activities of the enterprise:

INTRODUCTION

CHAPTER 1. Scientific and methodological foundations of innovative activity

1.1. The essence and role of innovations in the market economy

1.2. Innovative management technologies

1.3. Features of innovative activity in the organization

SECTION 2. Analysis of the enterprise's ECONOMIC ACTIVITY AND INNOVATION MANAGEMENT SYSTEM.

2.1. General characteristics of the enterprise

2.2. Analysis of the financial and economic activity of the enterprise

2.3. Evaluation of the enterprise's innovation management system and its impact on the efficiency of the enterprise's economic activity

CHAPTER 3. INCREASING THE EFFICIENCY OF INNOVATIVE MANAGEMENT OF THE ENTERPRISE

3.1. Ways of improving the management of innovative activities of the enterprise

3.2. Program for the implementation of measures to improve the management of innovative activities of the enterprise

3.3. The effectiveness of improving the management of innovative activities of the enterprise

SECTION 4. IMPROVEMENT OF LABOR PROTECTION

4.1. Analysis of the state of labor protection at the enterprise

4.2. Recommendations for improving the state of labor protection while improving the management of innovative activities of the enterprise

4.3. Socio-economic effectiveness of the implementation of measures to improve the state of labor protection at the enterprise

CONCLUSIONS

REFERENCES

APPLICATIONS

5. Conclusions

The thesis is the final result of the independent individual educational activity of the cadet (student), a scientific study that summarizes the results of his study of the disciplines provided for in the training plan and the completion of all educational and industrial practices.

The diploma work is performed on the basis of an in-depth study of the current legislation of Ukraine on the activities of enterprises and organizations, special domestic and foreign literature, best practices on the problem being studied, as well as the results of the cadet's or trainee's own research of a real object.

The thesis must be logical, demonstrable, argumentative, have proper design and all necessary supporting documents.

*Topic*thesis is chosen by the cadet or trainee in accordance with the recommended topic, agreed with the academic supervisor, discussed at the meeting of the graduating department and approved by the rector.

Object, based on the material of which the diploma work will be performed, is an enterprise in the aviation or tourism industry. The subject of the research is one of the urgent problems of modern management, which corresponds to the tasks and skills provided by the variable component of the specialist's educational and qualification characteristics.

*Content*thesis is determined by its topic and is reflected in the plan developed with the help of the scientific supervisor. The thesis must contain: title page; content; a list of conditional abbreviations (if necessary); introduction; the main part; conclusions; references; applications (if necessary).

*Main part*thesis consists of four sections: theoretical-methodological, analytical, development-implementation and labor protection. Within each section, three subsections are allocated, which should reflect the logical sequence of research and development of own proposals. At the end of each section, conclusions are presented with a concise statement of the scientific and practical results presented in the section

PROCESSING OF INFORMATION SOURCES

According to the topic, the cadet or student selects literary sources (monographs, textbooks, abstracts of candidate and doctoral dissertations, brochures, articles in scientific specialized publications, theses of scientific conferences, etc.).

It is appropriate to be guided by the traditional logic of studying literary sources:

- general familiarization with the publication as a whole and its content;
- reading the text sequentially or selectively;
- writing (copying) materials directly related to the topic;
- critical assessment of selected materials;
- formation of the corresponding fragment of the thesis text.

Writing a thesis involves studying the current legislation, resolutions of the Cabinet of Ministers of Ukraine, decisions of the Verkhovna Rada, regulatory documents of relevant ministries and other governing bodies on issues related to the topic of the thesis. It is also appropriate to use statistical materials of the Ministry of Statistics of Ukraine, in particular the statistical collection "Ukraine in Figures", statistical data published by the State Aviation Administration and the State Service of Tourism and Resorts.

It is advisable to pay special attention to the study of materials published in the periodical press (newspapers and specialized magazines), where the most modern results of scientific research are presented.

At the current stage of society's development, the Internet is becoming an important source of secondary information.

When borrowing definitions, quotations, etc., appropriate references must be made in the text of the thesis.

When completing the diploma research, the cadet (student) must process at least 50 information sources.

COLLECTION AND PROCESSING OF ACTUAL MATERIAL

The thesis must be performed using scientific sources and actual material that reflects the activity of the enterprise or organization that is the object of the study.

The source of information is planned and actual indicators of economic activity, statistical and accounting reports, orders, orders, results of observations, surveys, etc., which are collected by a cadet or trainee during pre-diploma practice.

Of particular importance is the correct generalization of the accumulated factual material, grouping and processing of data, on the basis of which the analysis is carried out and one's own proposals for improving the activity are substantiated.

In order to maintain the acquired skills of working on a personal computer and the skills of algorithmization and programming, every cadet or trainee must use a computer when writing a thesis.

FORMATION OF THE THESIS

The requirements for the design of diploma theses correspond to the main requirements of the HAC of Ukraine for the design of dissertations and abstracts of dissertations.

The thesis is printed on a computer on one side of a sheet of white A4 paper (210x297 mm) with one and a half line spacing. When typing on a computer, use the Times New Roman font of the Word text editor, size 14, normal bold.

With the written permission of the Dean of the Faculty of Management, the thesis can be submitted for defense in the form of a manuscript. At the same time, it should be taken into account that with the above computer format, each page contains about 1500 characters, that is, the total volume of handwritten work must be listed.

The text is printed, leaving margins of the following sizes: left – 25-30 mm, right – 10-15 mm, upper and lower - 20-25 mm. The font should be clear, black, with the same density of the text.

The language of the thesis is national, the style is scientific, clear, without spelling and syntactic errors, the sequence is logical. Direct copying of materials from literary sources in the work is unacceptable.

Typographical errors, misspellings and graphic inaccuracies can be corrected by cleaning or painting over with a corrector and applying the corrected text (fragment of the picture) in the same place with black ink or paste with a density close to the main text.

The headings of the structural parts of the thesis CONTENTS, LIST OF CONVENTIONAL ABBREVIATIONS, INTRODUCTION, CHAPTER, CONCLUSIONS, LIST OF USED SOURCES, APPENDICES are printed in bold capital letters symmetrically to the text. Headings of subdivisions and points are printed in bold in small letters (except for the first one) with paragraph indentation. Do not put a period at the end of the title.

The distance between headings and text should be 2-3 spaces.

Each structural part of the thesis should be started on a new page.

Numberingpages, sections, subsections, figures, tables, formulas, appendices are given in Arabic letters without the number sign.

Page numbering without a dot after it is placed in the upper right corner of the sheet.

The title page is the first page of the thesis. The title page is not numbered. The second page is the table of contents. The documents accompanying the thesis are sewn between the title page and the table of contents (see chapter 13). These documents are not subject to common numbering.

TABLE OF CONTENTS, LIST OF CONVENTIONAL ABBREVIATIONS, INTRODUCTION, CONCLUSIONS, LIST OF SOURCES USED, APPENDICES are not numbered as chapters. The section number is placed after the word SECTION, do not put a dot after the number, then the section title is printed from a new line.

Subsections are numbered within each section. The subdivision number consists of the section number and the serial number of the subdivision, between which a dot is placed. There should be a period at the end of the subdivision number, for example: 2.3. (the third subsection of the second chapter). Then, in the same line, there is a subsection heading.

An example of the design of section and subsection headings is given in Appendix M.

All figures, tables, formulas and appendices must be referenced in the text. Figures, tables and formulas must be submitted in the thesis immediately after the text where they are mentioned for the first time, or on the next page. Figures and tables that are located on individual pages are included in the overall numbering of pages and are placed in such a way that they can be read without rotating the text or with clockwise rotation.

Drawings must be made with ink, ink, black paste or using a computer. Their quality should ensure clear reproduction. All drawings must have a name, which is placed after the number, symmetrically to the illustration.

Any illustrations (drawings, diagrams, graphics, diagrams, maps, etc.) are marked with the word "Fig." and are numbered consecutively within the section, with the exception of those placed in appendices.

The number of the illustration should consist of the number of the section and the serial number of the drawing, between which a dot is placed.

For example: Fig. 2.3. (the third picture of the second chapter). The number of the illustration, its name and explanatory captions are placed directly below the illustration.

Tableis a way of presenting information, in which digital or textual material is grouped into rows and columns, separated from each other by vertical and horizontal lines.

Each table must have a name, which is placed above the table and printed starting with a capital letter in bold font symmetrically to the text. All data given in the tables must be reliable, uniform and comparable.

Tables are numbered consecutively (with the exception of tables presented in appendices) within a section. In the upper right corner above the relevant table title, the italicized inscription "Table" with its number is placed. The table number should consist of the section number and the serial number of the table, between which a dot is placed, for example: Table 1.2 (the second table of the first section).

When transferring a part of the table to another sheet, the word "Table" and its number are indicated once above the first part of the table, above the other part they write - Continuation of the table. 1.2. Moving part of the table to the next page, repeat its head and side in each part of the table. When dividing the table into parts, it is allowed to replace its head or side with column or row numbers, numbering them with Arabic numerals in the first part of the table.

Headings of graphs in the table begin with a capital letter, and subheadings - with a lower case, if they form one sentence with the heading. Subheadings that have an independent meaning are capitalized. Do not put periods at the end of headings and subheadings of tables. Headings and subheadings of graphs are indicated in the singular.

The unit of measurement must be indicated in the tables. If all units of measurement are the same for all indicators in the table, they are indicated in the title. The units of measurement must be indicated in accordance with the standards. Numerical values in the table must have the same number of decimal places.

Formulasin the thesis, they are aligned across the width of the text and numbered within the section. The number of the formula consists of the number of the section and the serial number of the formula in the section, between which a dot is placed. Formula numbers are placed near the right side of the sheet at the level of the corresponding formula in round brackets, for example: (3.1) (the first formula of the third section).

It is allowed to transfer formulas to the next line only on the signs of the performed operations, repeating the sign of the operation at the beginning of the next line. When transferring formulas to sign multiplication operations, the sign "x" is used.

Explanations of the values of symbols and numerical coefficients are placed directly under the formula in the sequence in which they appear in the formula. The value of each symbol and numerical coefficient must be entered on a new line. The first line of the explanation begins with the word "de" without a colon.

Above and below the formula, you must leave at least one free line.

Formulas that follow one another and are not separated by text are separated by commas.

Appendicesare drawn up as a continuation of the thesis on its following pages, placing them in the order of appearance of references in the text of the work.

Before starting the applications, the word "APPENDICES" is printed in capital letters on a separate sheet. Each application must start on a new page. The appendix must have a title printed at the top in small letters with the first capital letter symmetrically relative to the text of the page. In the middle of the line above the title, the word "Appendix" and a capital letter indicating the appendix are printed in small letters from the first capital letter.

Appendices should be marked consecutively with capital letters of the Ukrainian alphabet, with the exception of the letters Г, Э, З, И, Й, Й, О, Ч, б, for example, appendix A, appendix B. One appendix is designated as appendix A.

If necessary, the text of the annexes can be divided into sections and subsections, which should be numbered within each annex. In this case, each number is preceded by a designation of the appendix (letter) and a period, for example, A.2 - the second section of appendix A; D.3.1 - subsection 3.1 of Appendix D.

Illustrations, tables and formulas in the text of the appendix should be numbered within each appendix, for example, fig. D.3 - the third figure of Appendix D; table A.2 - the second table of appendix A; formula (A.1) is the first formula of appendix A. If the appendix has one illustration, one table, one formula, they are numbered, for example: fig. A.1, table A.1, formula (B.1).

Notesto the text, tables and figures, in which reference and explanatory data are indicated, are numbered consecutively within one page, they are placed at the bottom of the sheet and separated from the main text by a solid line.

When writing a thesis, it is necessary to give references to the sources used (at least 2 references per page).

References in the text should be indicated by the numbers of the sources by which they are listed in the "List of used sources". They are separated by square brackets. For example: "...in works [1-3, 7, 23] special attention is paid to the research of this aspect of the problem."

If you cite a quote or statistical data from a source with a large number of pages, in addition to the number, indicate the page where the quote is taken, for example: "...according to the American specialist F. Kotler, it is advisable to highlight the following stages of marketing research [43, p. 234]. ..".

Sources from which tables and figures are borrowed are given directly after the tables and figures. Then leave two intervals and continue the text part.

References to figures, tables, formulas and appendices in the thesis are indicated by their serial number, for example: "in Fig. 2.3 you can see ...", "in Table 1.3 ..."; "calculate according to formula (2.1) ...", "... given in Appendix B". In repeated references to figures, tables, formulas and appendices, the abbreviated word "see" should be used, for example: "see Table 1.1".

Information about the sources included in the list of used sources (at least 50

items) must be submitted in accordance with the requirements of the state standard.

THESIS MANAGEMENT

According to the direction of diploma research chosen by the cadet or trainee, the graduating department appoints a scientific supervisor.

The academic supervisor conducts individual counseling of the cadet (student), recommends literary sources, helps to draw up a thesis plan, fill out an individual assignment form, monitors compliance with the execution schedule, reviews parts of the work and the completed manuscript, prepares the graduate student for the defense.

Leading teachers and scientists of the department of management and economics, as well as specialists of institutions and enterprises, who work on the profile of a diploma thesis and have a corresponding scientific degree, are appointed as academic supervisors.

In some cases, when researching a problem that requires the development of mathematical models, statistical data processing, creation of computer software, etc., in addition to the scientific supervisor, the student is assigned a scientific consultant who provides assistance in writing individual sections or subsections of the work.

CONCLUSION OF THE SCIENTIFIC SUPERVISOR ON THE THESIS

The diploma work completed by the cadet or trainee is submitted to the academic supervisor, who checks it and makes a conclusion about the possibility of defending the work at the State Examination Commission.

The supervisor also puts his signature on the title page of the thesis.

In the event of a negative feedback from the academic supervisor, the cadet or student must eliminate the shortcomings, make corrections and submit the thesis to the academic supervisor for re-checking.

The review of the scientific supervisor is made in an arbitrary form. It is advisable to:

- to provide a general description of the work, to determine its compliance with the purpose and tasks;
- indicate the theoretical level of developments, their completeness, depth, originality and reasonableness of the proposed solutions;
- determine the argumentation of the statements and the reliability of the materials used;
- to assess mastery of methodological techniques and tools of research, modern methods of processing economic and statistical information, including with the help of a personal computer;
- to assess the good faith and conscientiousness of the cadet (student) in the process of writing a thesis.

It is also appropriate to identify the main shortcomings of the thesis. A critical analysis of the strengths and weaknesses of the work should have a reference to the text of the thesis.

At the end of the review, the degree of compliance of the diploma thesis with the requirements set forth by the higher school for graduation papers at the educational and qualification level "specialist" in the specialty "Management of foreign economic activity" is noted, and a conclusion is made regarding the possibility of admitting the thesis to the defense at the State Examination Commission.

The feedback is drawn up on a form in handwritten form and does not require a special confirmation (stamp), but only the personal signature of the scientific supervisor.

RECEIVING ADMISSION OF THESIS FOR DEFENSE AT THE GRADUATING DEPARTMENT

Admission of diploma theses to the defense is carried out at the graduating department of management and economics according to the approved schedule, during the four weeks preceding the defense of the diploma thesis at the State Examination Commission.

The teachers of the department check theses for compliance with the established requirements for structure, content, volume and design. If there are no comments, one of the teachers makes an appropriate mark on the form about admitting the thesis to the defense at the State Examination Commission.

If certain deficiencies are found in the work, they must be eliminated and the diploma must be submitted for consideration again.

In case of significant inconsistencies of the work with the established requirements, the department may make a decision on the impossibility of admitting such diploma work to the defense at the State Examination Commission.

Without the permission of the graduating department, the thesis is not allowed to be defended.

THE PROCEDURE FOR FILING THE THESIS

After receiving the supervisor's feedback, the cadet or trainee prepares an information card and an abstract for the thesis, then makes a brochure of it.

Accompanying documents are attached to the thesis in the following order:

- title page;
- thesis assignment;
- information card + abstract;
- conclusion of the manager.

Next, the work is hemmed in the order specified in section 9 of these instructions.

The thesis, bound in a hard cover, is submitted by the cadet or student to the head of the graduating department, who makes the final decision on its admission to defense at the State Examination Commission, making a corresponding mark on the form.

EXTERNAL REVIEW OF THESIS

After receiving admission to the defense, the cadet or trainee receives a referral for external review at the graduating department.

The list of external reviewers is drawn up at the graduating department of management and economics no later than 4 weeks before the start of thesis work and approved by the dean of the faculty.

An external reviewer – a leading specialist in the field, a scientist or a teacher at another higher education institution – carefully examines the thesis and prepares a review.

The following questions should be reflected in the thesis review:

- relevance of the research topic;
- completeness of topic development;
- reliability of the materials used;
- application of modern information processing methods;
- positive qualities and main disadvantages of work with references to the text of the thesis;
- the independence of the cadet's (student's) achievements regarding conclusions, recommendations, ways to solve the problem;
- the presence of elements of novelty in the proposals;
- the practical value of the work and the reality of the implementation of proposals;
- general impressions of the thesis (design, style and literacy of presentation, etc.).

At the end of the work, there should be a final conclusion regarding the qualification of the cadet (student), his ability to work independently in his specialty. If desired, an opinion can be expressed about the evaluation of the work according to a four-point system: excellent, good, satisfactory, unsatisfactory.

It is advisable to print the review on the letterhead of the institution where the reviewer works.

The review should mention P.I.P. reviewer, scientific title, academic degree, place of work, position. The personal signature is certified by a seal at the place of work and confirmed by the signature of a personnel service employee.

The recommended volume of the review is 1-2 pages.

PREPARATION OF THE THESIS FOR THE DEFENSE

To the inner page of the thesis cover, the cadet or student glues an envelope in

which the external review is placed.

If there is an order letter from the enterprise or organization, the cadet or trainee must also receive feedback on the thesis from the enterprise-customer. This review and the order letter must also be placed in an envelope.

During the preparation for the defense, the cadet (student) must agree with his academic supervisor on the concise report on the thesis and the prepared visual materials (4-6 pages with the most important figures and tables, which are made out in the form of posters or printed on a printer for each member of the committee ; slides, photos, layouts, advertising brochures, etc. are added upon request).

The length of the text of the report should correspond to 10 minutes of speech. The report should reflect: justification of the topicality of the topic, the purpose and task of the work, the main results of the analysis of the materials of the current enterprise and the creative developments of the author. A special place should be given to substantiated proposals and recommendations and evaluation of their effectiveness.

Visual materials should consistently illustrate the report of the cadet (student) and ensure complete coverage of all the provisions that are subject to protection.

Before the defense, it is advisable to carefully read the external review, pay special attention to the comments made by the reviewer and, if possible, eliminate the indicated shortcomings or prepare reasoned answers.

The thesis defense is open, if desired, the cadet or student can invite their relatives and friends to the defense.

DEFENSE IN THE STATE EXAMINATION COMMISSION

The thesis is defended at an open meeting of the State Examination Commission, the schedule of which is approved by the rector of the academy.

The following documents are submitted to the meeting of the State Examination Commission before the start of the defense:

- extract from the order of the rector of the academy on approval of the personnel of this commission;
- the list of cadets (students) of the examination group who are admitted to the defense of theses, signed by the dean of the faculty;
- a certificate from the dean's office on the cadet's (student's) implementation of the curriculum and the grades he received in theoretical disciplines, educational and industrial practices;
- diploma work of a cadet (student);
- written conclusion of the thesis supervisor;
- external review of the thesis;
- other materials that characterize the scientific and practical value of the completed thesis (certificates on the implementation of proposals in the

practical activity of the enterprise, published articles of the cadet (student) on the topic of the thesis, etc.).

The defense procedure is recorded by the secretary of the commission.

At the open thesis defense, one of the committee members presents the work of the graduate, announces the list of accompanying documents and gives the floor to the cadet or trainee for a report.

The cadet or trainee briefly reports to the commission the essence of the conducted research within 10 minutes, gives an assessment of the results obtained, illustrating the report with reference to visual materials.

After the cadet's (student's) report, the chairman of the commission reads the review of the thesis, and the cadet's (student's) has the opportunity to respond to all the reviewer's comments.

During the thesis defense, members of the State Examination Commission, teachers and specialists present at the defense may ask the cadet (student) questions about the content of the thesis. The cadet's (student's) answers should be specific, reasoned and short.

After the cadet's (student's) answer to the question, the conclusion of the scientific supervisor of the completed thesis is announced.

Diploma theses are evaluated according to the following parameters and criteria:

- the level of scientific development of the problem;
- quality of economic calculations;
- the quality of the analysis of the state of labor protection and working conditions;
- the level of validity of proposals and the expediency of their practical implementation;
- conformity of the design of the thesis with the established requirements;
- volume and adequacy of primary sources used in writing the work;
- the structure and logic of the report;
- quality of visual material;
- completeness of answers to the questions of commission members;
- the ability to formulate and defend one's own opinion on issues related to the problem of diploma research.

Based on the results of the defense of the thesis at a closed session, the State Examination Commission makes a decision on the evaluation of the defense and work (taking into account the conclusions of the supervisor and the reviewer), on assigning the specialist the qualification "manager-economist" and on issuing him a diploma of the state standard.

The meeting of the commission is drawn up by a protocol, in which

appropriate evaluations for the defense are entered, questions of the members of the State Examination Commission and those present at the defense, personal opinions of the commission members, the obtained educational level, as well as the name of the state document on education (diploma) issued to the graduate are recorded.

The protocol is signed by the chairman and members of the commission who participated in the meeting.

The grade for the defense of the thesis is also recorded in the student's information and record book and must be announced.

After the completion of the work, the state examination commission prepares a report, which reflects the main quantitative indicators regarding the level and quality of success in defenses, characteristics of completed diploma theses regarding the possibility of implementing specific proposals into the practice of existing enterprises and organizations, regarding the level of application of modern information and computer technologies in analytical studies, etc.

A cadet (student) who received an unsatisfactory grade in the defense of his thesis must be expelled from the academy and in this case he will be issued an academic certificate of the prescribed format. He retains the right to be re-admitted to take state exams (if he received an unsatisfactory grade on the exam) or to defend his thesis within the next three years. The diploma work is performed again in the presence of the cadet's (student) application for admission to the defense, the permission of the rector and the decision of the graduating department to approve the topic and object of research, appointment of a scientific supervisor. At the request of the department, the topic of the thesis can be changed or within the same topic, the cadet (student) can significantly expand and supplement the materials of the work.

If the defense of the diploma thesis did not take place for good reasons, about which the cadet (student) must submit relevant documents to the State Examination Commission, the rector of the academy may extend the period of his studies until the next term of work of the commission for the defense of diploma theses, but for no more than one year.

Regardless of the reasons, repeated defense of theses, taking state exams in the same year is strictly prohibited.

Materials for self-control:

AND. Questions for self-control:

B. Test tasks and problems

Summing up.

List of recommended literature

Main:

1. Gutorov O.I. Methodology and organization of scientific research: study guide. Kharkiv: KHNAU, 2017. 272 p.
2. Danilyan O.G., Dzoban O.P. Organization and methodology of scientific research: teaching. manual Kharkiv: Pravo, 2017. 448 p.
3. Degtyarev A.V., Kokodiy M.G., Maslov V.O. Fundamentals of scientific research: a study guide. Kharkiv: KHNU named after V. N. Karazina, 2016. 78 p.
4. Kostyukevich V.M., Konnova M.V. Methodology of scientific research: study guide. Vinnitsa. 2017. Vol. 172.
5. Malyhina V.D. Methodology of scientific research. Rivne. 2016. 247 p.
6. Methodology of scientific research: teaching manual. / V.I. Zatserkovnyi, I.V. Tishaev, V.K. Demidov – Nizhyn: NSU named after M. Gogol, 2017. – 236 p.
7. Methodology of scientific research in medicine: teaching. manual / V.D. Babajan, N.S. Bakumenko, O.I. Kadykova and others; under the editorship P.G. Kravchuna, V.D. Babajana, V.V. Meat eater. – Kharkiv: KhNMU, 2020. – 260 p.

Additional:

1. Puzanova O. G. Information provision of evidence-based health care. Part I. / O. G. Puzanova, T. S. Gruzheva // Proof. honey. – 2014. – No. 4 (16). - P. 23-33.
2. Skakun M. P. Fundamentals of evidence-based medicine: monograph / M. P. Skakun. - Ternopil: Ukrmedknyga, 2005. - 244 p.
3. Chernobrovy V. M. Health, pre-disease, disease: medical and social aspects and assessment. Risk factors. Preventive medicine: a guide for graduate students, interns, general practitioners - family medicine / V. M. Chernobrovyi, S. G. Melashchenko, T. M. Tkachuk. – Vinnytsia: Planer, 2013. – 80 p.
4. Shulyak V. I. International experience of using an integrated clinical protocol in medical practice (literature review) / V. I. Shulyak // Ukr. honey. magazine – 2010. – No. 5 (79). - P. 41-44.
5. Howick J. The Philosophy of Evidence-Based Medicine / J. Howick. - Oxford: Blackwell-Wiley, 2011. - 238p.

Electronic information resources:

1. Best Evidence. URL: http://www.bestevidence.com/
2. BritishMedicalJournal. url http://www.bmj.com/specialties/evidence-based-practice
3. CanadianMedicalAssociation. URL: http://www.cma.ca/
4. Center for Evidence-based Medicine at the University of Oxford. URL: http://www.cebm.net/
5. Clinical Evidence. URL: http://clinicalevidence.bmj.com/x/index.html
6. Cochrane Collaboration open learning material for reviewers. URL: http://www.cochrane-net.org/openlearning
7. Cochrane Library. URL: http://www.thecochranelibrary.com/
8. Current Controlled Trials. URL: http://www.controlled-trials.com/mrct
9. eGuidelines. URL: http://www.eguidelines.co.uk/

10. Evidence-Based Medicine. URL: http://ebm.bmj.com/
11. Canada Clinical Guidelines Database. URL: http://www.phac-aspc.gc.ca/
12. JAMAEvidence. URL: http://www.jamaevidence.com/
13. Medscape. URL: http://www.medscape.com/
14. National Institutee for Clinical Excellence. URL: http://www.nice.org.uk/
15. PRODIGY (Clinical Guidance). URL: http://prodigy.clarity.co.uk/

Practical lesson No. 11

TOPIC:"Design of epidemiological studies" - 2 hours

Goal:familiarize yourself with the basics of epidemiological research design (case-control, cohort, randomized clinical trials), the concept of "gold standard".

Basic concepts:

Term	Definition
Evidence-based medicine	- evidence-based section of clinical medicine
Scientific research	–is organized specifically to receive (confirm) new data
Randomization	- random allocation of patients to groups - the optimal method of treatment selection, which allows avoiding a systematic error when dividing patients into groups. Conducting randomization allows patients to be divided into groups mainly with the same characteristics.
The gold standard of medicine	The principle of randomization (random) - "randomly selected groups" - has become the gold standard of medicine. The most acceptable and reliable is a randomized study with the principle of double-blind control.
Non-randomized studies	provide for the allocation of patients to groups in a non-random way if random allocation is impossible for technical reasons or ethical reasons.
Cohort studies	involve the formation of two or more groups (cohorts) of patients, of which only one is evaluated for the appropriate medical or therapeutic intervention, although the clinical result is recorded in all groups. Observations can last for years (for example, the effect of smoking on the development of lung cancer).
Description of a case or series of cases	- these are short messages about successful treatment or manifestations of threatening complications of pharmacotherapy, which is extremely necessary for operational medical information.
"pyramid of evidence"	Systematic reviews, randomized clinical trials, cohort studies, case-control studies, case reports, editorials, insights, animal studies, in vitro studies
Clinical epidemiology	- the methodological basis of DM. She studies the patterns of distribution of any diseases, predicts them in each specific patient based on the study of the clinical course of the disease in similar cases. KE solves all its problems directly on people and in no case on animals or elements of the human body - the culture of tissues, cell membranes, etc.
Epidemiological	- is a set of techniques designed to study the causes,

method	conditions of the occurrence and spread of diseases and other conditions in the human population.
Population	- this is a large group of people living in a certain geographical region (for example, in Ukraine) and reproduces itself in a number of generations.
Sample	is a specially selected part of the population. Clinical trials are usually performed on samples, since it is impossible and usually not necessary to study the entire population.
valid (final) clinical result (clinical outcome)	– a phenomenon that is important for changing health indicators (recovery, disability, mortality, life expectancy) and/or quality of life;
indirect (indirect) efficiency criterion	– a laboratory indicator or symptom, the dynamics of which directly characterizes the patient's condition and is reflected in the final clinical result;
absolute risk	- the absolute difference between the frequency of development of an undesirable effect when using a medicinal product (LZ) and the frequency of development of the same effect without the use of a drug;
relative risk	- the ratio of the frequency of the development of an undesirable effect among persons who were exposed to the factor under investigation (used drugs) to the frequency of the development of a similar effect in the group of persons who were not exposed to this factor (did not use drugs).
Epidemiological research design	The design of an epidemiological study means all the features of conducting a specific study, provided for in its plan. These features are denoted by numerous terms, and only their combination makes it possible to see all the characteristic features of the study.
Continuous epidemiological studies	- this is research conducted in the scope of the general population, which in epidemiology is more often denoted by the term population.
Selective epidemiological studies	- based on data obtained during the study of the incidence of a relatively small part of the population - a sample. The purpose of sample studies is to obtain representative information that could be extrapolated to the entire population.
Descriptive research	- provides for obtaining descriptive epidemiological data, that is, data on morbidity. Such a study can be independent, but the obtained new descriptive epidemiological data prompts the continuation of the study to explain the detected manifestations of the disease. Therefore, a descriptive study is, as a rule, only the first part of a full-fledged epidemiological study, which necessarily includes an analytical part as well.

Analytical research	- dedicated to identifying the causes of the occurrence and spread of diseases. The search process corresponds to general scientific ideas about two methods (directions) of identifying connections between the supposed cause and effect. According to the methods of finding reasons, two types of analytical studies have been developed: case-control and cohort studies.
A case-control study	- an analytical retrospective study, the purpose of which is to identify risk factors for the disease being studied. The main group is selected from people with the disease being studied, the control group consists of people who do not have this disease. The fact of the influence of the investigated risk factors is determined by a survey of persons in the compared groups.
Observational study	does not involve interference in the natural process of the emergence and spread of diseases.
Experimental study	- a controlled intervention in the natural course of the disease in order to identify its causes is foreseen.
Routine examination	- is considered any epidemiological research, within the scope of official duties. It does not involve obtaining new scientific data, on the contrary, routine research is carried out within the framework of currently existing scientific ideas about the causes of the occurrence and spread of the disease.
A prospective study	- involves the study of information as new (fresh) cases of the disease appear that did not exist before the beginning of the study, the study of cause-and-effect relationships is based on the second method - from cause to effect.
A retrospective study	- based on the study of information about cases of the disease that occurred at any time in the past, while using the first method of finding cause-and-effect relationships - from the effect to the cause.
Dynamic (longitudinal) study	- involves the systematic study of information about morbidity among the same population group.
Clinical research	-related to the place of epidemiological research, it is used only to denote experiments carried out in the clinic to assess the potential effectiveness of medicinal drugs, methods of diagnosis, and treatment schemes for patients. Such studies are called RCTs.
Clinical study (KD)	is a prospective comparative study of the effectiveness of two or more interventions (therapeutic, preventive or diagnostic), in which the results are compared in groups that differ in the applied intervention. At the same time, the hypothesis about the effectiveness of the tested method (the impact of the intervention on the result) that arose before the research is

	usually tested.
"simple blind method"	- not informed patient
"double blind method"	- both the patient and the researcher are not informed. Thus, the "double-blind method" serves as a type of control to prevent the influence of bias on the results of the study.
triple blind method	- the patient, the researcher, and the statistician processing the research materials are not informed.

Actuality of theme

Globalization of information processes in all spheres of knowledge and, in particular, in medicine, posed qualitatively new problems of decision-making before the doctor, health care organizer and patient. Even in new reference books, outdated information is often given, and the recommendations of experts in textbooks and reviews are not supported by evidence. The flow of medical information continues to grow - there are about 40,000 medical and biological journals published in the world, in which approximately 2 million articles are published annually. Practitioners and managers of the health care system urgently need a critical assessment of information.Only evidence-based medicine, or evidence-based medicine, can solve these problems. It is now at the center of attention of clinicians, health care leaders, lawyers, patients and the public.

Evidence-based medicine involves the conscientious, reasoned, and common-sense use of the best current evidence to treat each patient. According to another definition, evidence-based medicine is a branch of medicine that is based on evidence that involves searching, comparing, summarizing and disseminating the obtained evidence for use in the interests of patients. The practice of evidence-based medicine involves combining individual clinical practical experience with the best available independent clinical evidence obtained from systematic studies.

The practice of evidence-based medicine involves combining individual clinical practical experience with the best available independent clinical evidence obtained from systematic studies. Individual clinical practical experience is defined as the professionalism and judgment acquired by an individual clinician through the means of his clinical practice. Best independent clinical evidence refers to data from clinically relevant studies, often in fundamental fieldsof medicine, but mainly of clinical research while preserving the accuracy and precision of diagnostic tests (including clinical examinations of patients), assessing the adequacy of prognostic markers, as well as the effectiveness and safety of therapeutic, rehabilitative and preventive measures.

Physicians should use both individual clinical experience and the best available clinical evidence, and never just one. Without individual hands-on clinical experience, clinical decision-making is significantly influenced by evidence obtained from even flawlessly conducted studies, which may be inadequate for an individual patient. On the other hand, making practical decisions without taking into account independent practical decisions can also harm the patient.

Plan

I. Organizational moment (greetings, checking those present, announcing the topic, the purpose of the lesson, motivating students to study the topic).
II. Control of basic knowledge: Theoretical questions for the lesson:
1. Peculiarities of conducting an epidemiological study.
2. Solid research.
3. Sample studies.
4. Representativeness of the sample.
5. Principle of randomization.
6. Mechanical selection.
7. Typological (typical) sample.
8. Serial (nest) selection.
9. Method of directed selection.
10. Descriptive research.
11. Analytical research.
12. Case-control study.
13. Supervisory study.
14. Experimental research.
15. Scientific (special) research.
16. Routine research.
17. Retrospective study.
18. Prospective study.
19. Simultaneous (cross-sectional) studies.
20. Dynamic (longitudinal) study.
21. Field research.

III. Formation of professional skills and abilities. Practical works (tasks) performed in class
1. To learn the theoretical foundations, modern principles, regularities and legal principles of evidence-based medicine in the context of preserving and strengthening the health of the population.
2. Interpret the basic definition of evidence-based medicine.
3. Develop measures to organize the family doctor's activities with the resources of evidence-based medicine and ways to improve it.
4. To be able to fill out basic accounting medical documentation and analyze reporting forms of the medical service.
5. Develop preventive management solutions based on evidence aimed at strengthening and preserving the health of people of all ages.
6. To understand the content of market transformations in the practical activities of medical institutions and individual practitioners for the best selection of treatment for various pathologies.
7. Develop management solutions to meet the needs of the population in medical care.

Know:

- definition of the term "evidence-based medicine" as a subject of teaching, its significance for health care practice;
- prerequisites for the emergence of evidence-based medicine;
- leading principles of evidence-based medicine;
- tasks of evidence-based medicine;
- Classification of epidemiological studies;
- Comparative characteristics of various types of research, evaluation of the degree of evidence and their results;
– epidemiological research design: empirical and experimental studies;
- retrospective and prospective studies;
– empirical studies (descriptive and analytical);
– descriptive epidemiology: description of an individual case and a series of cases;
- Analytical epidemiological studies: case-control, cohort, randomized clinical studies;
– concepts of randomization and stratification;
- Gold standard research;
– research ethics;
- Types of design;
- Types of control;
- "blindness" of the study;
- Required sample size;
- Selection of the object and research unit;
– inclusion and exclusion criteria.

Topic content:

Design, methods of conducting and organizing research - these terms are synonymous with the term structure.

Under the design of an epidemiological studyunderstand all the specifics of conducting a specific study provided for in its plan. These features are denoted by numerous terms, and only their combination makes it possible to see all the characteristic features of the study. The variety of species and differences in the organization and conduct of epidemiological studies are shown in the table. 1.

Solid research. Comprehensive epidemiological studies are studies conducted in the scope of the general population, which in epidemiology is more often denoted by the term population. In the general case, the object of observation, which represents the totality of all units of observation, is called the population which

have certain signs their oftenare called signs of inclusion / exclusion in the population.

Table 1

Basic concepts characterizing certain features of epidemiological studies

Classification sign	Name of the study
The purpose of the study	

- Describe the incidence or other phenomenon that refers to the subject area of epidemiology - Explain established manifestations of morbidity, etc.	- descriptive - analytical (case-control study and cohortresearch)
General scientific method	
- observation - experiment	- supervisory - experimental (randomized field and clinical trial)
The scope of the phenomenon being studied	
- all phenomenon (general totality) - a specially selected part of the phenomenon	- continuous - selective
Type of cognitive activity	
- scientific (special) - daily	- scientific (special) - routine
The presence of the events being studied at the beginning of the study:	
- the event has already happened - the occurrence of events is predicted - events took place butthe occurrence of new events is predicted	- retrospective - prospective - combined
Time of research	
- a certain moment - a certain period of time	- single moment (transverse) - dynamic (longitudinal)
Place of research	
- in a clinic or other medical and preventive facilities - outside the clinic	- clinical - field

In epidemiology, as mentioned earlier, these signs refer to signs time, mclaimant and "persons".Ideacarrying out continuous researchassociated with the desire to obtain comprehensive information about the studied phenomenon. The size of the population, and therefore the volume of continuous research, in scientific and routine research differ significantly. If we assume that the goal of scientific research is to find out the causes of the occurrence and spread of this disease in general, and not in relation to some territorial group of the population, then the population in such a case should be the entire population that is prone to the risk of the occurrence of this disease.

If the goal of scientific research is to study the causes of diseases only in a given country or city, then the population is the corresponding population of the country or city. The general population in routine analytical studies is even smaller in

volume, for example, when investigating an outbreak of a disease in an "organized" group of children. In this case, the population is all children and all staff of this institution or one (several) groups, depending on the initial hypothesis about the cause of this outbreak.

Despite the study of the phenomenon in its entirety, one should not think that the results of a continuous study are a priori more accurate than a selective one. The accuracy of data from a continuous study depends on many factors. For example, if a continuous study is large-scale, then a lot of employees participate in its implementation, whose qualifications are quite difficult to standardize, this will affect the results of the study. The main disadvantages of continuous research are the large expenditure of time, effort and resources, often the impossibility of conducting them.

Selective research, which is the main special tool of many sciences, allows to overcome the shortcomings of continuous.

Selective studies. Sample epidemiological studies are based on data obtained during the study of the incidence of a relatively small part of the population - a sample. Based on them, they draw conclusions about the peculiarities of the studied phenomenon in the entire population (general population), from which the specified sample was formed. Thus, the purpose of sample studies is to obtain representative information that could be extrapolated to the entire population.

The correctness of the data directly depends on the representativeness of the sample, which, first of all, is determined by the correct choice of the general population. Subsequently, a part of observation units is selected from the general population. At the request of the researcher, the general population can be limited by various characteristics (time, territory, age, profession, and other social and biological characteristics of people).

In addition, the representativeness of the sample is ensured:

- the required number (volume, size) of the sample;
- untilby the principle of randomization.

The size of the sample depends on many components, and primarily on the nature of the study. If the purpose of the study is to estimate the incidence of the disease among the population, then it is necessary:

- choose (set) the degree of reliability of measuring morbidity, i.e. the amount of possible deviation of the sample data from the population study data;
- approximately know the frequency of diseases that can be established.

If the population size is unknown, the sample size is calculated using the formula:

$$n = \frac{T2 \times (I \times q)}{\Delta^2}$$

If the population size is known, the sample size is calculated using another formula:

$$n = \frac{I \times q \times t2 \times N}{(N \times \Delta 2) + (I \times q \times t2)}$$

where (for both formulas)

n – sample size;

N – population size;

t – probability criterion (most often equal to 1.96); I is the expected frequency of diseases;

q = R – I, where R is the dimension of the indicator I that is used;

Δ is the chosen maximum allowable error of the indicator, which is usually no more than 25% of the indicator I.

Suppose that in city N it is planned to conduct a simultaneous sample study with the aim of studying the frequency of new cases of arterial hypertension among men aged 20-29 years. The number of this population group in city N is 15,400. According to a study conducted several years ago, the frequency of new cases of arterial hypertension in this group of men in city N was about 70.0‰ (I = 70.0‰). Therefore, Δ will be 25% of 70.0, i.e. Δ = (25 x 70.0) / 100 = 17.5‰. Δ2 = 306.2‰. As a result

$$n = \frac{(70.0 \times (1000 - 70.0) \times 22 \times 15{,}400)}{(15{,}400 \times 306.2) + (70.0 \times (100{,}000 - 70.0) \times 22)} = 806$$

Thus, to obtain sample data corresponding to the required reliability, 806 people should be examined out of 15,400 people aged 20-29.

The second condition for achieving representativeness of the sample is the principle of randomization (from the English Random - case). Randomization provides a random selection from among individuals representing the general population. In other words, randomization is an equal chance for each unit of observation from the general population to get into the sample, which reduces the danger of unintentionally distorting the composition of the sample, but cannot completely exclude the dishonesty of the researcher during its formation.

Adherence to the principle of randomization is ensured by various methods of sample formation. The choice of method depends on:

- from research design;
- expected accuracy of results;
- the volume of the general population;
- the possibility of using the most accurate method and other objective and subjective reasons.

Currently, the ideal principle of randomization is considered to be the use of tables of random numbers or similar computer programs for sampling observation units. This method ensures random selection, in which the unit of observation is selected from the general population only once. This approach is mandatory for the formation of experimental and control groups when conducting most RCTs of various means and methods of treating patients. This contributes to the observance of the principle of research impartiality and the minimization of unintentional distortion of the composition of groups. And to a large extent, if the study design is followed, it provides reliable conclusions. However, it should be remembered that no design can completely exclude the dishonesty of a particular researcher.

The following methods are based on a certain planning in the selection of observation units, which naturally reduces compliance with the principle of randomization.

Mechanical selection. First, observation units are placed in order based on some random feature: medical history number, ambulatory card, first letter of last name, etc. Then it is necessary to determine the interval through which observation units will be mechanically selected from the list of the general population (for example, every fifth). To determine the interval, the number of the general population should be divided by the number of the required sample.

Typological (typical) sample. First, the general population is divided into groups based on some typical feature. Most often, various individual characteristics of people are used, such as age, profession, influence of presumed risk factors, illness, etc. Next, the required number of observation units is selected randomly or mechanically from each group. The size of the sample from each group should also be determined in advance, and the ratio of sample sizes (for example, by age) should correspond to the structure of the general population. Such a sample is often called a weighted typological sample. This method is most often used in observational analytical studies.

Serial (nest) selection. Serial (nest) selection is similar to typical. The difference is that during serial sampling from the general population, not individual units of observation are randomly selected, but entire groups of them, which are called series or "nests". "Nests" can be separate institutions, shops, medical wards, departments, wards, etc. Then in each "nest" a continuous study of all observation units is carried out.

Method of directed selection. The method of directed selection involves excluding some factors whose influence is well known from the analytical study even at the stage of determining the general population. For example, the effect of smoking on the risk of lung cancer is well known, but it is not the only factor. Therefore, researchers who set out to identify other additional risk factors for lung cancer should not include in the general population, and therefore, in the sample of people who smoke. The advantage of a sample study over a continuous one is that, with proper organization, reliable data can be obtained by spending much less effort, resources and time. When conducting sample studies due to their smaller volume, it is much easier to control the receipt of unified information and minimize possible errors. At the same time, for objective reasons, many studies study so-called biased samples that are insufficiently representative of the entire population, which should be taken into account when evaluating the conclusions of such studies. Characteristics of some terms defining the design of epidemiological studies.

Descriptive researchinvolves obtaining descriptive epidemiological data, that is, data on morbidity. Such a study can be independent, but the obtained new descriptive epidemiological data encourage the same or other researchers to continue the study to explain the observed manifestations of the disease. Therefore, a descriptive study is, as a rule, only the first part of a full-fledged epidemiological study, which necessarily includes an analytical part as well.

Analytical researchdedicated to identifying the causes of the occurrence and

spread of diseases. The search process corresponds to general scientific ideas about two methods (directions) of identifying connections between the supposed cause and effect. The first method is from effect to cause. When using it, starting from a previous consequence (for example, a disease), they try to find events in the past that could be considered as the causes of this consequence. Another trick is from cause to effect. Focusing on the influence of the alleged cause, they expect the emergence of a causally determined consequence.

According to the methods of finding reasons, two types of analytical studies have been developed: case-control and cohort studies.

A case-control study- an analytical retrospective study, the purpose of which is to identify risk factors for the disease being studied. The main group is selected from people with the disease being studied, the control group consists of people who do not have this disease. The fact of the influence of the studied risk factors is determined by a survey of persons in the compared groups, their relatives, according to archival data. Comparing the frequency of individual factors in the main and control groups allows you to calculate the odds ratio (OR), the value of which roughly estimates the presence of a cause-and-effect relationship.

Observational studydoes not involve interference in the natural process of the emergence and spread of diseases. They also include the study of morbidity in situations where intervention has become a mandatory practice. For example, routine study of the incidence of infections managed by immunoprophylaxis.

During the experimental study, on the contrary, provides for a controlled intervention in the natural course of the disease in order to identify its causes. At the same time, the epidemiological experiment must fully meet other general scientific requirements for any experiment. In this regard, the terms "natural" and "uncontrolled epidemiological experiment" used by some authors are incorrect. Since the result of the experiment is to answer the question why it happened as described in the experiment, any experimental research is always analytical.

Scientific (special) researchis organized specifically to receive (confirm) new data.

Any epidemiological study is considered routine, within the scope of official duties. It does not involve obtaining new scientific data, on the contrary, routine research is carried out within the framework of currently existing scientific ideas about the causes of the occurrence and spread of the disease. A typical example is the investigation of an outbreak of an infectious disease, when the search for the cause of its occurrence is based on the existing scientific understanding of all possible causes of such outbreaks.

A retrospective studybased on the study of information about cases of the disease that occurred at any time in the past, while using the first method of finding cause-and-effect relationships - from the effect to the cause. The main source of information is the existing system of registration and registration of patients. Retrospective research can be both descriptive and analytical.

A prospective studyinvolves the study of information as new (fresh) cases of the disease appear that did not exist before the beginning of the study, the study of cause-and-effect relationships is based on the second technique - from cause to effect.

At the same time, the study is based on the probability of new cases of the disease (effect) among the population group exposed to the risk factor (cause). Prospective studies are always only analytical.

Simultaneous (cross-sectional) studiescan be both descriptive and analytical. Perhaps, that is why in various epidemiological publications they are sometimes classified as descriptive or analytical studies. In any case, the main goal of these studies is to obtain information about the incidence of a certain disease in a limited period of time, if necessary, such studies can be repeated. Since a simultaneous study involves the identification of all cases of the disease that exist at the moment, it is also called a prevalence (incidence) study, and the results of a simultaneous study are often given in prevalence rates. If the detected cases are associated with the influence of any risk factor, the study can become analytical.

Dynamic (longitudinal) studyinvolves the systematic study of information about morbidity among the same population group. At the same time, the study can be continuous or repeated after short intervals of time. A typical example of a dynamic study is a routine operational and retrospective analysis of population morbidity, conducted by specialists of centers of sanitary and epidemiological surveillance.

Although the concept of "clinical" is related to the place of epidemiological research, it is used only to denote experiments conducted in a clinic to assess the potential effectiveness of medicinal drugs, diagnostic methods, and treatment schemes for patients. Such studies are called RCTs.

Field research is considered to beconducted outside medical and preventive institutions. Its scope is very diverse, from the investigation of a small outbreak to a nationwide investigation.

Field research can be:

- descriptive and analytical;
- supervisory and experimental;
- continuous and selective;
- routine and scientific;
- retrospective and prospective;
- simultaneous and dynamic.

None of the terms listed above can independently reveal all the features of conducting an epidemiological study. For example, the study of an outbreak of any disease is not only observational, but at the same time analytical, most often routine, continuous, one-time, retrospective or combined clinical or field test.

Research organization- is a coordinated, ordered, interconnected set of various actions that lead to the achievement of the intended goal. It consists of several stages:

- preparatory;
- information collection and primary statistical processing;
- statistical and logical analysis of the received information;
- formulation of conclusions (final stage). The preparatory stage includes:
- justification of the relevance (necessity) of the research;
- formulation of final (ultimate) and intermediate goals;

- formulation of a working hypothesis;
- selection of the object and research unit;
- programming;
- drawing up a plan;
- will dodays of the pilot study.

Most epidemiological studies provide for the achievement of an analytical goal, that is, aimed at identifying the causes of the occurrence and spread of the studied pathology. The first component is a descriptive section. No less important are studies devoted to the evaluation of the potential effectiveness of the proposed means and methods of combating the spread of diseases. In practical activity, it is not the potential efficiency that is revealed, but the real quality and efficiency of executive activity. According to the data obtained during the literature analysis, and to the set goal, a working hypothesis is developed - a possible explanation of the studied phenomenon. For example, a hypothesis about the causes of the occurrence and spread of an insufficiently studied disease or (for routine research) a hypothesis about the causes of an outbreak of a disease, but within the framework of possible causes of its occurrence known to science. The working hypothesis determines all subsequent actions and a significant part of the entire research design. In the course of the research, corrections can be made to the working hypothesis, but if this leads to a change in the program, then the research should be started from the beginning.

The object of research (observation) in epidemiological studies is comparison groups, which are called differently in different studies:

- exposed and unexposed;
- sick and healthy;
- main and control;
- experimental and control, etc.

These groups consist of sick and (or) healthy people - observation units, each of which is subject to mandatory registration. It is extremely important both in scientific and practical research to determine the criteria on the basis of which a person will be considered sick, that is, to formulate the symptoms of a standard case of a specific disease already at the preparatory stage. Sick and healthy people (units of observation) are carriers of different signs. Those signs that are supposed to be taken into account (registered) are called accounting.

The research program includes the information collection program and the data compilation and grouping program. The information collection program is a registration document that exists or is specially developed, which contains a list of accounting features necessary to fulfill the intermediate and final goal of the study. Accounting features are used in subsequent stages to group the received data, so they are grouping features. There are different classifications of accounting (grouping) features.

The main epidemiological classification of grouping signs is based on the selection of:

- diagnosis;
- signs of time;
- signs of place (territory);

- signs of "aboutsobi" (individual characteristics).

With the help of such signs, it is possible to divide both sick and healthy people into groups. In addition to the specified classification, accounting features are divided, in particular, into factor (factorial) and effective. Factors are those signs under the influence of which a person's state of health changes. Resultant signs are various assessments of a person's state of health, including test results and a diagnosis.

The division of accounting features into factorial and effective should be justified by a working hypothesis about the cause-and-effect relationship of the assumed risk factors and morbidity. Often, all signs are divided into those related to the unit of observation - a sick or healthy person, they are called individual factors, and into the signs of the habitat - environmental factors.

Every registration document should have a "passport" part in addition to the registration marks. It states:

- registration document number (of this surveillance unit);
- Date of completion;
- insurance policy number;
- ID;
- last name of the patient (healthy);
- age and other mandatory data for any research. The signature of the registration document endsom of the person who filled it.

The program for summarizing and grouping data- this is a set of table layouts, which are often called development tables. They are expected to be used in the second stage of the study. They will have registration marks from the registration documents. The layout should be such that the table, after filling, contains all the features of the investigated phenomenon that are expected to be detected. Thus, table layouts should be consistent with the goals and working hypothesis of the study.

Compiling table layouts is not only technical work, but mainly purposeful, well-thought-out actions. The main thing is the choice of characteristics for grouping, which are necessary for building a specific table. All three types of statistical tables are used in epidemiological studies: simple, group and combined.

Research plan- a document that reflects all the main actions necessary to achieve the goals. At the same time, the plan indicates the place and time of conducting the research, the necessary financial and technical means, personnel, the level of their training, the deadlines for the implementation of individual actions, etc. As a result, the design of this epidemiological study is finally determined, which should contribute to the fulfillment of the set goals.

Currently, in the organization of scientific epidemiological studies, great importance is attached to conducting so-called pilot (trial, tentative) studies.

Pilot studies, in particular, allow:

- specify goals and working hypothesis;
- clarify the information collection program and table layouts;
- check methods of information collection and methods of its study;
- assess the preparedness of the staff;
- get an idea of the variability of accounting features;

- estimate the correct oneschoice of research design;
- specify the amount of necessary funds and forces;
- specify the time of the event.

The stage of collecting information and its primary statistical processing is important.

The collection of information is understoodthe process of obtaining the necessary data and filling out registration documents. It is necessary to strictly adhere to the developed information collection program, to prevent violations of the rules for selecting observation units, excluding accounting features, and changing the methods and methods of information collection. In the process of collecting information, its quality is periodically assessed, compliance with established rules is monitored. The collected information is repeatedly aggregated and grouped according to table layouts. Such actions are called primary statistical processing of research data. The duration of the stage, depending on the design of the study, can vary from several hours (outbreak investigation) to several decades (prospective cohort study). In general, data collection lasts as long as it takes to obtain the necessary amount of information provided by the research program.

The final stage of the epidemiological studyincludes further statistical and logical processing of the received information, organization of the received epidemiological data and description of the study, formulation of conclusions (conclusion).

Further - after compilation and grouping - statistical data processing can be quite diverse and include a significant number of statistical methods. These methods make it possible to comprehensively and reliably describe the dynamics and structure of morbidity, as well as to measure the cause-and-effect relationship of presumed risk factors and morbidity. Despite the variety of statistical methods, the choice of a specific method should be strictly statistically and logically justified. Violation of this rule will inevitably lead to false conclusions.

For study collected information and representation resultsthe so-called organization of epidemiological data, i.e. their tabular and graphic representation, is of great importance for research. During the final stage, new tables are created, in which the results of the statistical evaluation of the differences of the compared values are necessarily indicated.

The graphic display of the received information allows you to demonstrate the features (regularities) of the dynamics and structure of the studied phenomenon present in the table. However, it is necessary to take into account that incorrectly constructed diagrams can significantly or even completely distort the patterns present in the tables.

The description of the research (report) should reflect in detail the entire course of work.

The formulation of conclusions (conclusion) is based on the results of a statistical and logical study of the collected information.

A case-control study. Purpose of the case-control study

- determination of the causes of the occurrence and spread of diseases. In case-control studies, the probability of the existence of a cause-and-effect relationship is

justified not by the different frequency of the disease, but by the different prevalence of the presumed risk factor in the main and control groups.

In a case-control study, the search for cause-and-effect relationships goes from the effect to the presumed cause.

A case-control study can only be retrospective, as it is conducted on the basis of archival data. Most often, the source of information in case-control studies is the case histories found in the archives of medical institutions, the memories of patients or their relatives as part of an interview or based on the results of a questionnaire.

This type of research can be conducted as a preliminary study of cause-and-effect relationships between the presumed risk factor and a specific disease. In the future, this problem can be studied in cohort studies.

Cross-sectional studies(prevalence studies, simultaneous studies). The purpose of a cross-sectional (simultaneous) study is to describe the relationship between a disease (or other health conditions) and factors that exist in a certain population at a specific time and have both a favorable and a negative effect on people. Simultaneous research often forms the basis for solving issues of operational management in health care. This is due to the possibility of constant updating of data on the state of health of individual contingents through the study of small population groups.

This study is performed at a certain point in time, but the collected facts may refer to events in the past (for example, the study of outpatient charts of patients in order to study how often blood pressure was measured in the last 6 years). As part of a cross-sectional study, the prevalence of disease cases and the prevalence of risk factors are assessed, as well as their combination.

Analytical studies. In medicine, analytical research is necessary to identify the quantitative assessment of the causes of the occurrence and spread of diseases of various etiologies. The results of these studies are used in the development of preventive measures aimed at eliminating or reducing the degree of influence of factors that lead to illness or other consequences.

Analytical studies have made a significant contribution to the development of modern medical science and practice by identifying the leading risk factors for the development of many diseases. For example, a link was established between lung cancer and tobacco smoking, a higher prevalence of stroke among people with hypertension, a direct link between rubella in pregnant women and birth defects in children, a causal link between arterial hypertension, smoking, high blood cholesterol and coronary heart disease, etc.

Analytical studies are included in the group of observational studies, the main condition of which is non-interference in the natural course of the processes of occurrence and spread of diseases (in contrast to experimental studies).

At the stage of organization of any scientific research, a working hypothesis is formed, which implies the prediction of the result for which this research is organized. In analytical studies, the working hypothesis implies the difference between the experimental group and the control group, that is, it is assumed that the studied factor has a cause-and-effect relationship with the studied effect result, for example, a disease. There is an alternative to the working hypothesis - the null

hypothesis, which experts disprove during the research. According to the null hypothesis, the studied groups of people do not differ from each other or the differences between them are statistically insignificant, and the presumed risk factor or etiological factor is not.

William Farr (1807-1883) - an English scientist, one of the founders of medical statistics, singled out the characteristics of a person, place and time, according to which systematization and analysis of data obtained in research are carried out. Thus, analytical research should answer a number of questions:

- why does someone get sick more often, and someone less often?
- why do some people get sick more often, and somewhere less often?
- why do people sometimes get sick more often, and sometimes less often?

The question "Why?" implies the search for a cause for a known investigation or the determination of an investigation from a known cause: in any case, the task is to establish a cause-and-effect relationship between a cause and an effect.

The final result of an analytical study is the determination of the cause or the probability of the existence of a given cause with a known effect.

Causes and consequences. David Hume (1711-1776), a Scottish philosopher, defined a cause as "an event which is followed by another, and when all events like the first are followed by an event like the second." According to this reasoning, the cause always precedes the investigation, it is a necessary condition for its occurrence. However, cases are known in medicine when the action of any pathogenic factor does not always lead to the occurrence of the disease.

Supervisory analytical epidemiological studies. The main advantage of such studies is the simplicity of conducting them. This is due to the fact that they usually use official data of registration of diseases and their consequences and official information about possible risk factors. For example, data on the state of the external environment, on the economic status of various population groups, their individual characteristics.

Cohort studies. The purpose of cohort studies is to determine the causes of the occurrence and spread of diseases. This is the most direct way to identify the etiology of diseases and quantify the risk of exposure to causal factors. The name of the study comes from the word "cohort" (a group of people). In various areas of human activity, the concept of "cohort" has its own characteristics:

- a military unit, the tenth part of a legion in ancient Rome, numbering 360-600 people (one cohort, as a rule, included 3 manipula);
- figuratively - a united group of people, associates;
- in medicine - a sample of people united by common signs of a state of health, in which it is expectedoccurrence of disease cases.

In any cohort study, the identification of the relationship between the causes of various outcomes occurs in the direction from the presumed cause to the consequence, most often from the risk factor to the disease.

A cohort study can be based on three types of information:

- retrospective (archive) data (medical histories, questionnaires, survey results of participants, etc.). Such cohort studies are called reprospective or historical;
- prospective data expected to be obtained during the study. Such cohort

studies are called prospective (parallel) cohort studies;

- mixed data (prospective and retrospective) - combinated cohort studies.

The representativeness of the sample is necessary for the extrapolation of the data obtained in the study to the general population. In other words, the results of a sample study should be relevant not only for the sample itself, but also for all people with similar characteristics. As a result of forming a cohort, a group of relatively healthy people appears in the study. This constitutes an important condition of research. Approximately half of the cohort participants are exposed to the risk factor, the rest of the sample is unaffected by the risk factor.

Disadvantages of cohort studies. Cohort studies, like any other study, have strengths and weaknesses that determine the scope of these studies. There are known situations in which cohort studies cannot be used. For example, when studying rare diseases, it is difficult to conduct a cohort study. There is a need to form a cohort of large numbers, so that there is an opportunity to meet cases of a rare disease. The rarer the disease, the greater the physical impossibility of creating the necessary cohort. The peculiarity of a cohort study is that the researcher expects results in groups, having data on such risk factors. In this situation, it is most expedient to study the impact on a person of rare risk factors, the effect of which experts know for sure. Other significant disadvantages of cohort studies are their high cost and often long duration, for example, the Framingham study lasted 46 years.

Advantages of cohort studies. The possibility of obtaining reliable information about the etiology of diseases, especially in cases where an experiment is impossible.

- The only way to estimate absolute, attributive, relative risk of the disease and to estimate the etiological share of cases associated with the estimatedrisk actor.
- Ability to identify causes that occur occasionally.
- The ability to simultaneously detect several risk factors is one thingth or several diseases.
- The rather high probability of the conclusions is due to the fact that in cohort studies it is much easier to avoid errors in the formation of the main and control groups, since they are created after the identification of the studiedeffects (diseases, deaths, etc.).

A randomized controlled trial.A clinical trial (CRT) is a prospective comparative study of the effectiveness of two or more interventions (therapeutic, preventive, or diagnostic), in which outcomes are compared in groups differing in the intervention used. At the same time, the hypothesis about the effectiveness of the tested method (the impact of the intervention on the result) that arose before the research is usually tested.

When there is a control group (comparison), it is called a controlled trial, and when groups are formed by the method of randomization, it is called a randomized controlled trial (RCD, randomized controlled trial according to the classification of study types in MEDLINE).

Advantages– the results obtained in the RCT better reflect the differences in the results that are important for patients; there are few systematic errors; the most objective for assessing effectiveness and verifying interventions; the results of RCTs performed strictly according to research design are the most reliable.

Disadvantages- it takes a long time to conduct an RCT; they are expensive; are not suitable for the study of rare diseases; these studies have limited generalizability of the results (possibility of transferring the results to the population). The latter limitation should not be overstated, as other types of studies have even poorer generalizability.

For the study, patients are selected from a large number of people with the condition being studied. Then these patients are randomly divided into two groups, comparable on the main prognostic features. One group, the experimental or treatment group, is exposed to an intervention (such as a new drug) that is expected to be effective. Another control group, or comparison group, is in the same conditions as the first, except that the patients included in it are not exposed to the study intervention. The reliability of clinical trials depends on the extent to which the compared groups were able to ensure the same distribution of all factors that determine the prognosis, except for the investigated therapeutic intervention.

Formation of the sample. Among the many reasons for which patients with an investigational disease are not included in the study, the following three reasons are the main ones:

1) Patients do not meet the established inclusion criteria. This is an atypical nature of the disease, the presence of other diseases, a poor prognosis of the disease, a high probability of the patient not complying with the proposed treatment. This limitation increases the reliability of the study: the possibility of cases unrelated to the treatment itself is reduced.

2) In cases of refusal of patients to participate in experiments (clinical trial).

3) Patients who, in the early stages of the trial, showed an inability to strictly follow the proposed treatment method are excluded. This will avoid financial and medical futile efforts and reducedprobability of research.

To study the specific therapeutic effect of an intervention (medicine), it is necessary to assign patients to groups randomly, that is, by randomization. Randomization is the optimal method of treatment selection, which avoids systematic error when dividing patients into groups. Conducting randomization allows patients to be divided into groups mainly with the same characteristics.

If trial participants know who is receiving which type of treatment, there is a possibility of a change in their behavior, which could lead to systematic error. To reduce this effect, a blind method is used. The blind method in clinical trials can be carried out at the following levels:

1) researchers who assign patients to intervention groups do not know which treatment will be assigned to each subsequent patient;

2) patients should not know whichthey themselves receive treatment;

3) doctors should not know which treatment (drug) is prescribed for the patient;

A "single blind method" (patient not informed) or a "double blind method" (both patient and investigator not informed) are used. Thus, the "double-blind method" serves as a type of control to prevent the influence of bias on the results of the study.

There are two ways to analyze data in a randomized trial. The first method is

an analysis depending on the prescribed treatment, that is, according to the groups formed during randomization; the result serves as a criterion for making clinical decisions. The second method is an analysis depending on the actually received treatment; the result allows judging the biological mechanisms of the intervention.

It is clear that a clinical trial includes averaged observation data for patients who differ from each other. In order to obtain information about a specific patient, clinicians can rely on the results of observations of subgroups of patients or conduct tests on their own patients.

It is possible that treatment that is effective on average for a group of patients may be ineffective in specific patients. Although the results of a reliable clinical trial serve as a sufficient basis for its use in a specific patient, the experience of observing this patient is also important. The method of testing on a single patient is an improved variant of a more general informal process of trial and error. The patient is sequentially prescribed one or another treatment (drug or placebo) in a random order, for a short period (1-2 weeks). At the same time, neither the patient nor the doctor knows which medicine is prescribed. The results are evaluated after each period and subjected to statistical analysis. This method is necessary in cases where the course of the disease is unpredictable, the response to treatment is manifested quickly, and there is no overlapping of pharmacological effects after changing drugs.

The results of blinded randomized controlled trials should be preferred over any other information on treatment effects. However, such tests have limitations: expensive; there may not be a sufficient number of patients with the researched disease; duration of the experiment; misunderstanding of doctors and patients in the need to conduct clinical trials and others. When solving many clinical questions, it is not always possible and practical to rely on the results of randomized clinical trials, so other evidence is also used.

Thus: RCTs remain the "gold standard" of research in medicine [10]. They are characterized by the following features:

- Uniform selection of patients (strict selection criteria maximize the probability of distinguishing the effect and background fluctuations).
- Randomization into experimental and controlled groups (placebo or comparator).
- Blind tests. In double-blind trials, neither the patient nor the doctor (observer) knows, towhich group the patient belongs to.

At the same time, it is necessary to note the problematic aspects of the RCT, including:

- Impossibility of generalization. Strict selection criteria lead to

that test results may not necessarily be applicable to other patients.

- An unrealistic clinical situation is created when patients are observed by highly motivated researchers who do not know exactly which drug (tested or placebo, control drug) the patients are taking.
- Conducting truly blind trials is difficult, because observers, subjects (patients) can recognize the effect of the drug by its pharmacodynamic parameters (for example, a decrease in blood pressure or heart rate when takingand certain classes of drugs).

Materials for self-control:

A. Questions for self-control:

1. Define epidemiology.
2. List the tasks solved by the epidemiology of non-infectious diseases.
3. What essential features distinguish the epidemiology of infectious diseases from the epidemiology of non-infectious diseases?
4. What is the design of an epidemiological study, its types?
5. Describe a continuous epidemiological study. Inclusion and exclusion criteria?
6. Give the characteristics and features of a selective epidemiological study?
7. What is randomization? Its main purpose.
8. What is the peculiarity of blinding in epidemiological studies.
5. What are empirical epidemiological studies, what methods do they include?
6. What epidemiological studies are called experimental and their main methods?
7. Describe descriptive epidemiological studies.
8. What tasks does analytical epidemiology solve?
9. What is the difference between case-control and cohort studies?
10. What epidemiological methods do you know depending on the duration of the study?
11. Describe controlled and uncontrolled studies?
12. What is a cohort? Describe the classic scheme for conducting cohort epidemiological studies.
13. Охарактеризуйте класичну схему проведення епідеміологічного дослідження на кшталт «випадок-контроль».
14. Які завдання дозволяють розв'язати експериментальні дослідження?
15. Охарактеризуйте класичну схему контрольованих експериментальних досліджень.
16. Який тип клінічних досліджень сьогодні вважається «золотим стандартом»?

Тестові завдання для контролю засвоєння матеріалу

1. Контрольоване випробування - це:

A. ретроспективне
B. проспективне
C. поперечне
D. перпендикулярне

2. «Золотим стандартом» медичних досліджень називають:

A. перехресні дослідження
B. одиночне сліпе дослідження
C. рандомізовані контрольовані
D. парні порівняння

3. Метод, при якому ні хворий, ні лікар, що наглядає за ним, не знають, який метод лікування був використаний

A. подвійний засліплений
B. потрійний засліплений
C. одиночний засліплений
D. плацебоконтрольований

4. Безпечна неактивна речовина, що пропонується під видом ліків, яка не відрізняється від ліків за зовнішнім виглядом, смаком, запахом, текстурою, називається
A. біодобавка
B. аналог препарату, що досліджується
C. гомеопатичний препарат
D. плацебо

5. Дослідження, в котрому пацієнт не знає, а лікар знає, яке лікування отримує пацієнт, називається
A. плацебоконтрольоване
B. подвійне засліплене
C. потрійне засліплене
D. просте засліплене

6. Як створити умови, щоб в рандомізованому контрольованому дослідженні пацієнти, що отримують плацебо, не були ошукані:
A. лікуючий лікар отримує усну згоду пацієнта на проведення випробування
B. пацієнт підписує «Інформовану згоду» (де передбачена його згода на використання плацебо)
C. плацебо не чинить шкідливого впливу на організм, тому його застосування не вимагає згоди
D. пацієнт підписує згоду на госпіталізацію

7. Дослідження з випадково відібраною контрольною групою та наявністю впливу з боку дослідника називається
A. рандомізоване контрольоване клінічне випробування
B. нерандомізоване дослідження
C. обсерваційне дослідження
D. ретроспективне дослідження

8. В поняття «золотого стандарту» входять
A. подвійні-сліпі плацебо-контрольовані рандомізовані дослідження
B. прості нерандомізірованние дослідження
C. потрійні сліпі дослідження
D. подвійні-сліпі нерандомізірованние дослідження

9. Свідоме, чітке і безпристрасне використання кращих із наявних доказів при прийнятті рішень про допомогу конкретним хворим - це одне з

визначень поняття:

A. біометрії
B. доказової медицини
C. клінічної епідеміології
D. медичної статистики

10. За способом відбору пацієнтів, дослідження розрізняють на
A. випадкові і складні
B. рівноімовірні і неможливі
C. рандомізовані і нерандомізовані
D. первинні і третинні

11. Випадковий відбір спостережень носить назву
A. рандомізація
B. медіана
C. мода
D. ймовірність

12. За ступенем відкритості даних дослідження може бути
A. відкритим або сліпим
B. закритим або сліпим
C. відкритим або рандомізованим
D. рандомізованим або мультицентровим

13. З позиції доказової медицини лікар повинен приймати рішення про вибір методу лікування на підставі
A. інформації з інтернету
B. досвіду колег
C. статті з рецензованого журналу з високим індексом цитування
D. статті з невідомого джерела

14. Показники, що характеризують надійність інформації, приведеної в науковому журналі, це
A. індекс достовірності
B. індекс довіри
C. індекс значимості
D. індекс цитованості

15. Однією з передумов виникнення доказової медицини є:
A. обмеженість фінансових ресурсів, що виділяються на охорону здоров'я
B. поява нових лікарських спеціальностей
C. вдосконалення методів наукових досліджень
D. розвиток математичної статистики

Еталони відповідей на тести:

1-B; 2-C; 3-A; 4-D; 5-D; 6-B; 7-A; 8-A; 9-B; 10-C; 11-A; 12-A; 13-C;14-

D;15-A.

Підведення підсумків.

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5. Clinical Evidence. URL: http://clinicalevidence.bmj.com/x/index.html
6. Cochrane Collaboration open learning material for reviewers. URL: http://www.cochrane-net.org/openlearning

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Practical lesson No. 12

SUBJECT: "Criteria for evaluating the quality of research and its legal support" - 2 hours

Goal:familiarity with the criteria for evaluating the quality of research and their legal support.

Basic concepts:

Term	Definition
Hirsch index	is an indicator of the influence of a scientist, a team of scientists, a scientific institution or a scientific journal, based on the number of publications and their citations. The Hirsch index was proposed by the American physicist Jorge Hirsch in 2005.
Citation	is the direct artistic use of a primary source with reference to it, the introduction of another author's text to the text of one's own work, the direct and sometimes indirect borrowing of individual elements and themes from a literary primary source.

Actuality of theme

The increase in general interest in the problem of determining the criteria for the effectiveness of scientific research is due to the development of the information society, the growth of public demand for high-quality information production, the highest form of which is the production of scientific information. The development of scientific approaches to solving the problem of the quality criteria of scientific activity in our time, as well as in the general information process, takes place along with the consideration of the technocratic (quantitative) parameters of the development of research methods, as well as the substantive characteristics of scientific achievements, which, in fact, concern quality of science. Such an approach in the process of integration of scientific activity into production becomes especially relevant.

The problem of determining modern criteria of scientific activity is reflected in the development of a number of foreign scientific centers, in particular special committees of the Council of the International Mathematical Union, the International Council for Industrial and Applied Mathematics (ICIAM), the Institute of Mathematical Statistics (ISM) in the USA, the Royal Academy of Arts and Sciences of the Netherlands, the Canadian Federation of Humanities and Social Sciences, etc. A significant contribution to the solution of this problem was made by a number of domestic scientific institutions: the Research Center of Scientific and Technical Potential and the History of Science named after AHEM. Dobrova of the National Academy of Sciences of Ukraine, department of bibliometrics and scientometrics of

the National Library of Ukraine named after V.I. Vernadskyi (NBU) under the leadership of the laureate of the State Prize of Ukraine L.Y. Kostenko and others. However, the problem of determining the criteria for the effectiveness of modern scientific activity, especially in the context of reflecting the interests of national development, requires further analysis.

Plan

I. Organizational moment (greetings, checking those present, announcing the topic, the purpose of the lesson, motivating students to study the topic).
II. Control of basic knowledge: Theoretical questions for the lesson:

III. Formation of professional skills and abilities. Practical works (tasks) performed in class:

- Basic documents in scientific activity;
- Evaluation of the results of scientific activity;
- Criteria for evaluating scientific activity.

Topic content:

The level of innovative development of modern Ukraine, unfortunately, is approaching the point at which it becomes acceptable to talk about national science only as a traditional, albeit hardly useful, attribute of the social structure of modern Ukraine. In the circles of officials, focused exclusively on foreign innovative processes, opinions are already being cultivated about the unnecessary burden of such a burden as financing domestic science for the budget of modern Ukraine. More and more often people are indifferent to national interests and at the same time have simple-minded and naive ideas that we can buy everything we need in the West. The spread of such sentiments in the Upralin sphere is harmful to Ukrainian society not only by demonstrating its ignorance, but also by the fact that it provokes the strengthening of a nihilistic attitude towards domestic science among broad sections of the population and accustoms society to the idea of the gradual elimination of this type of activity. Ukraine runs the risk of gradually abandoning the production of the main product of our time - information (and its highest form - scientific) and because of this, losing the perspective of national development.

At the same time, the development of scientific information in the structure of information resources is directly related to the transforming activity of society and is an important indicator of the viability of the nation and the state in the information society. The contribution of each nation and state to the general civilizational information assets will determine, and is now increasingly determining, the place of each of them in the world social hierarchy. Given the clear manifestation of such a tendency, the attitude towards domestic science determines which place in the new

world hierarchy of the information society our country, our nation, will claim in the near future. We can save on domestic science, on the development of domestic technologies and completely transform into consumers of information products provided to us by advanced countries. Of course, on their terms and taking into account their interests. In this regard, we must be ready not only for the promotion of unification, the curtailment of the process of original national and cultural development, but also for many economic, political and other decisions of the states — the leaders of modern progress, which shift the problems of their own development onto the shoulders of the states — subjects of global influence. Conversely, while ensuring the development of domestic scientific activity and innovative society, opportunities are created for Ukraine's worthy participation in the international division of labor, national development acquires a new perspective, new qualitative achievements.

At the same time, the thesis that the development of the information society takes place in the directions of the most effective use of information resources is especially relevant for scientific information, which is the most effective in the process of modern social development.

The development of the latest methods of measuring the criteria of the effectiveness of science is a very important matter, as it provides the possibility of solving the problem of effective administrative management of scientific activity, which is quite difficult for our society, which should connect the interests of society with its scientific component. In the optimal version, this management should provide effective scientific support for both national and general social development, creating as few obstacles as possible to creative search and promoting the productive use of its results. The fact that this problem is far from being solved is evidenced by a fairly popular point of view rooted in traditional approaches to scientific activity, connected with the conclusion about the unpredictability and weak formalization of science as a kind of creativity. As noted in the preface to the collection of works "Scientometrics and expertise in the management of science", these circumstances are the reason that the attitude to scientific activity can be compared "to a field in which a seed is dormant in the ground ... which needs to be "watered" evenly, because a priori it is not clear where the seeds are and where they are not, where they are useful and where they are weeds. So far, formal evaluations in general and scientometric evaluations in particular help to fight only with obvious "bushy" weeds that have already grown, or to localize clearly empty areas."

Such a figurative comparison deserves special attention in view of the fact that at the current stage of relations, it quite comprehensively characterizes the relations of administrative bodies with the scientific community in a considerable number of countries that do not belong to the leaders of the information society. This

comparison can also be applied to Ukrainian realities. The harvest (results of scientific activity) is expected, often without sowing (without setting specific socially significant tasks), equally watering (financing) both useful activity and its imitation, without going into the content of the processes taking place in the scientific environment (where there are seeds, and where there are not). At the same time, they use only superficial achievements of information society technologies (formal evaluations in general and scientometric ones in particular) to fight against weeds that have already grown, or they try to localize clearly empty areas, substituting such a formal attitude for the necessary in-depth insight into the problems of reorganizing the relationships of science and management. However, the worst thing is the loss by some representatives of management structures of any interest at all in the results of domestic scientific activity, the transition to the use of "overseas products", far from always useful and high-quality, but those that remove all worries, labor costs and the need to make decisions , to bother with the need to reform one's own social relations in the field of scientific information production. At the same time, the field of national scientific activity turns into a so-and-so cultivated meadow, according to the famous English type, which can only have a decorative value.

So, partly indifference to the fate of domestic science, partly the lack of desire, or even the ability of state officials to solve strategic issues, to immerse themselves in complex problems of relations with science, problems caused by the constant political instability characteristic of our society and, accordingly, the rotation of management personnel , supporting such disinterest in foreign competitors in the field of innovative technologies — all this has a negative impact on the fate of Ukrainian science. It is obvious that the popularity of the topic of introducing scientometric indicators to determine the effectiveness of scientific research, approved until recently in management structures following some experts, is also largely caused, paradoxically, not by an attempt to intensify the scientific process, but, rather, by a desire to shift the burden of studying existing problems for the analysis of formal indicators, based on bibliometric information and related to the development of electronic databases and the possibilities of automatic calculation of relevant indices.

The popularization of the Hirsch index in determining the efficiency of scientific activity became, among other things, a tribute to the features of the initial period of the development of the information society, which is characterized by a sharp increase in the volume of information production, in which, according to the technocratic parameters of information exchanges, the meaningful quality is lost. In this way, the right to determine the quality and truthfulness of scientific achievements by the majority of its members formally belonging to the scientific community (through citation) actually returned to science from the past. The viability of this method of recognition in science is determined by the commitment to it of middle-

class people from among the scientific community, who have mastered computer technologies and use them to replicate the developed idea in multivariate updates, exchange links with others of their kind. At the same time, if the multivariateness of the update is to some extent useful, as it increases the efficiency of using new scientific information, albeit with a certain repetition, then the "mafia" of organized citation is a destructive fact, like any other "organized" recognition.

Orientation when making management decisions related to the organization of scientific activity exclusively on citation indexes is methodologically unfounded and, as researchers testify, can lead to ineffective management decisions.

Recently, the panacea for determining the real scientific contribution of a researcher to modern science is the fact of his publication in rated foreign journals, speeches at international conferences, followed by the preparation of monographic studies and textbooks. Management structures are also suggested to be guided by this direction of evaluation of scientific activity. If we draw a certain analogy with the development of the general information process, such an approach can be compared with the creation of search engines, which is a more qualified solution for finding the necessary scientific information and determining its significance, in contrast to applied amateurism. In science, it makes it possible to determine the level of articles, based on the level of publications in which they are published, or the level of scientific information in theses, based on the level of the conference.

A guide to the scientific significance of a publication can also be its placement in scientometric databases that accumulate journal-level articles, such as Web of Science, Scopus, Google Scholar, etc. However, focusing on this criterion of scientific efficiency, we also face certain problems. Yes, Google Academy displays all publications posted on the Internet, without distinguishing them by the quality of scientific information; Web of Science specializes in scientific articles, and mostly in English, not covering conference reports and monographs with its scientometrics; Scopus includes these types of scholarly information, but a clear preference is given to English-language texts.

It should be noted that language bias in approaches to international scientometrics is not the only problem in assessing the scientific objectivity of these guidelines. The scientific information produced nowadays is subject to the general characteristics of the development of the global information space. And in this space, the scientific and all other interests of the leading globalizing countries are reflected. Beyond any doubt, these interests are reflected in specialized thematic international publications, and in the policy of forming scientometric databases, and in other international structures organized to evaluate the effectiveness of scientific information. This circumstance should also be taken into account when applying international tools for managing domestic science. In addition, the desire to gain

serious scientific authority with the help of these tools turns into a significant loss of time, and this, in turn, negatively affects the process of implementing scientific results into practice.

So, summarizing the discussion about the problems of science management in modern conditions, the researchers rightly come to the conclusion that "only professional expertise can provide a comprehensive objective assessment of scientific results and merits; scientometric indicators serve as a tool to support decision-making by experts."

A wide international discussion regarding the methodology of evaluating the effectiveness of modern scientific activity testifies to both the relevance of this issue today and the need to abandon the search for a universal methodology for such evaluation. The available experience in this case indicates the usefulness of certain methods in some cases and the unjustification of their use in others. For example, the Hirsch index, which is increasingly criticized among specialists, weakly responding to the criteria of the usefulness of scientists from the point of view of using their potential to solve local scientific and technical problems facing a specific country, at the same time can qualitatively illustrate the dexterity and energy of a researcher in propaganda certain ideas.

The basis for determining the effectiveness of scientific activity should be a concretely established socially significant goal, and evaluation criteria should be developed accordingly. An important issue is the provision of professional, qualified expertise. Obviously, in view of the growing importance of the production of scientific information for social development, this kind of activity should be carried out collegially, reflecting the interests of the customer, qualified scientific experts, and representatives of the field of scientific activity management in the composition of the relevant evaluation structures. An example of such an organization of expert activity can be the German Science Council, which advises the federal government on issues of scientific research and higher education. This council, one of the most famous international structures, recommends focusing on its own academic systems for evaluating and ranking the results of the NDR based on alternative web methods of calculation and individual systems for indexing scientific publications in the open systems of the global network Google, with refinement of the methodology by collectives of recognized scientists in accordance with the specifics of the field.

The Royal Netherlands Academy of Arts and Sciences also has a special committee for determining quality criteria in social (medical and environmental) humanities research to understand the future planning of these studies.

According to the correspondent member of the National Academy of Sciences of Ukraine L.A. Dubrovina, today the international scientific community has already gained considerable experience in the development of methods for evaluating the

effectiveness of scientific activity, which can be used with appropriate adaptation in the interests of the development of domestic science. Thus, the tendency to move away from the concept of efficiency in humanities research in its economic sense is worthy of attention, it is recommended to replace this concept with an orientation to "result" and "impact", "practical output", without limitations on the number of scientific works calculated at the same time. It is also important that popular scientific works are evaluated and taken into account as introduction into the spiritual sphere, into the social circulation of new knowledge (see the analytical review of works and conceptual views of foreign scientists. Such a position is particularly significant for our reality, given the serious shortcomings in this direction of activity in the information space of Ukraine.

L.A. Dubrovina also draws attention to the fact that the American Society for Cell Biology proposes to carry out a comprehensive assessment of the quality of scientific articles primarily based on the analysis of the justification text and other documents, the study of the scientific content presented by the applicant on paper, and only as supporting material use the metrics of the journal in which they were published. To assess the value of developments, both all research results (including databases and software) to be added to the analysis of the publication should be considered, as well as a wide range of impact measures, including its qualitative indicators, in particular the impact on policy and public practice.

The above-mentioned special committee of the Royal Academy of Arts and Sciences of the Netherlands criticized the fact that when using current methods, a significant amount of scientific and popular science production is ignored, which remains outside the scope of analysis in citation indexes, publication of scientific results on the Internet. In this connection, it is worth noting that the question of the scientific value of Internet resources is very timely, maybe even a bit late at the current stage of the development of the information society and only requires the development of relevant reliable methods. The current level of development of electronic information technologies can already provide such reliability today.

Studying the improvement of the system for evaluating the effectiveness of scientific research in the USA, L.A. Dubrovina rightly drew attention to experience, which can be particularly relevant for the development of innovative activity in Ukraine. It is about the use of the metric system Star metrics, which has been developed since the end of 2012 to measure the effectiveness of innovative research and the competitiveness of US science.

The study, initiated by a group of scientists from the University of Michigan, the University of Chicago and the University of Ohio, made it possible to analyze the effectiveness of the projects of federal scientific agencies and research institutes in order to evaluate the results of investments in public sectors of the economy. The

main tasks of the project were to establish uniform rules for calculating the impact of federal scientific research on the growth of scientific knowledge, social results, the quality of the workforce and economic growth; evaluation of the results of scientific research in the field of innovations, competitiveness of science; monitoring the impact of federal research grants and contracts on the effectiveness of conducted research.

The given examples testify to the actual strengthening of the tendency to define target criteria related to the satisfaction of specific interests of innovative development, when determining the effectiveness of scientific activity, to the rejection of the practice of transferring responsibility for this process to the editors of international rating publications. They also demonstrate the growing importance given today in the scientific and managerial circles of various countries of the world to clarifying the criteria for evaluating scientific activity in the conditions of informatization and global competitive challenges in all spheres of social activity. The quality of scientific production has become a criterion for success in the modern world. And the experience of perfecting the relevant parameters of scientific activity, developing effective efficiency criteria in science today deserves special attention. The generalization of this experience and the development of modern, effective criteria for evaluating research work in Ukraine should also become the lever with which the necessary activation in the scientific field can be carried out.

From the point of view of national interests in the field of scientific information production, the criteria for the effectiveness of new scientific information should be improved taking into account:

• the degree of correspondence of scientific achievements to tactical and strategic demands of national development, related to external and intra-societal challenges, the need for internal transformation and adequate action to successfully respond to them;

• efficiency of obtaining scientific results necessary for national development, their relevance;

• the cost level of scientific research available for the national economy and the ratio of this cost to the economic efficiency of the obtained results.

These criteria are also joined by the transformative feature of the evolution of the actual scientific process, which was previously little taken into account, related to:

• the ratio of new and traditional in the scientific process;

• the use of scientific achievements verified by practice as criteria for the reliability of new scientific results;

• ensuring confirmation of scientific progress in harmonizing new directions of scientific research with the logic of cognitive activity of our society developed by all previous generations.

Having determined the criteria for the modern development of Ukrainian science that are optimally possible in the conditions of domestic realities, relying on the achievements of the domestic scientific potential, we still have the opportunity to participate on an equal basis in the international division of labor in the field of scientific and socially significant information creation. Under the conditions of increased attention to the needs of national science, the formation of a qualified public demand for domestic scientific research, the normalization of the very important issue of the effective introduction of scientific work into the practice of public life, Ukrainian science can be not only profitable for the state budget, but also become a significant source its filling, an important step in national development at the stage of global transformations.

Concept project of evaluation of the results of scientific activity

The concept determines the legal and organizational basis for evaluating the effectiveness of scientific activity, establishes the principles, criteria and indicators of such evaluation.

The draft concept was developed in accordance with the main provisions of the current regulatory and legal framework of Ukraine in the field of scientific activity, in particular the Law of Ukraine "On scientific and scientific and technical activity" dated December 13, 1991 No. 1977-XII, the resolution of the Cabinet of Ministers of Ukraine "On approval of the Procedure for the formation and execution of an order for conducting scientific research and development, design and construction works at the expense of the state budget" dated August 25, 2004. No. 1084, resolution of the Presidium of the Academy of Sciences of Ukraine "On approval of the Procedure for the formation of topics and control over the implementation of scientific research in the National Academy of Sciences of Ukraine" dated January 28, 2005 No. 24, DstU 3008-95 "Documentation. Reports in the field of science and technology. structure and design rules", which was approved by the order of the State Committee of Ukraine for Standardization, Metrology and Certification dated February 23, 1995 No. 58 and entered into force on January 1, 1996.

Terms

1. The purpose of the concept is to define and systematize the tools for objective evaluation of the results of scientific activity, generalization of the scientific and practical (social, economic, ecological) value of the performed scientific research.

2. the results of research and development works within the framework of fundamental and applied research, carried out in accordance with state targeted scientific and technical (economic) programs, separate agreements, contracts and tasks financed from the funds of the state or local budgets, are subject to evaluation.

3. The general assessment of the results of completed fundamental and applied scientific research for a certain period is one of the components of the analysis of the activity of a scientific institution.

4. the evaluation results can be used when making decisions regarding the continuation (or termination) of funding of works related to the next stage of scientific research.

Principles, principles, criteria, indicators of evaluation of the results of scientific activity

5. The process of evaluating the results of scientific activity is based on the following basic principles:

— the uniqueness, originality, importance of the obtained results of scientific research work (R&D) in terms of promoting the further development of a certain field of science both in Ukraine and in the world;

— conducting targeted fundamental scientific research, the results of which contribute to the initiation of important applied scientific and technical projects in the interests of the national economy;

— implementation of the NDR with the participation of recognized scientific schools, specialists of leading universities and scientific research institutions (domestic and foreign);

— organization and conducting of all-Ukrainian and international scientific and scientific-practical conferences by the executors of research;

— the involvement of the institution implementing the NDR in national and global scientific cooperation, participation in joint scientific projects, receiving international grants;

— training for conducting research of highly qualified scientific personnel (candidates and doctors of science);

— involvement of gifted youth from higher education institutions and scientific research institutions in carrying out research.

6. the main principles of evaluating the results of scientific activity are:

— perspective;

— relevance and consistency with priority areas of development (in the field of science and technology, innovative activity);

— scientific novelty and innovative orientation; — practical value;

— global integration.

7. The summary of the activity of the scientific team is characterized by a clearly established list of results in the field of fundamental and applied research. In particular, the results of fundamental research assume that:

— a discovery was made;

— a new phenomenon or a new property of a previously studied phenomenon

is discovered;

— a report was prepared;

— a scientific hypothesis was put forward and substantiated; — the concept was developed;

— the theory is formulated

— methods of solving partial scientific tasks are summarized;

— previously known approaches to the application of theories and the use of inventions in practice are systematized.

the results of applied research are characterized by the development of projects:

— normative legal act; — programs, strategies;

— methods (methodical recommendations, methodology);

— standards.

8. Forms of recognition of scientific results of fundamental and applied research are divided into basic, additional and special.

Basic forms:

— publication of scientific articles (in domestic and foreign specialized publications);

— publication of a study guide, a textbook, a scientific monograph (chapters in collective scientific monographs), a scientific report;

— approval of the final scientific report on the results of the implementation of the scientific research by the academic council of the institution.

Additional forms:

— acceptance for consideration by bodies of executive and legislative power (central, regional; ministries, departments, committees);

— organization of public scientific events (round table, conference, educational seminar).

Special forms:

— awarding of awards (state, international);

— awarding of an honorary academic title (by a domestic or foreign scientific or educational institution).

9. criteria for evaluating the results of scientific activity are divided into two groups.

The first group includes criteria:

— novelty (sign — the presence of new scientific knowledge in the results; level — from already known to a completely new array of knowledge; indicators — discoveries confirmed by expert opinions in the field of fundamental research, patented inventions and objects of industrial property in the field of applied research);

— significance for science and practice (sign — scale of impact of scientific research results on science, economy, social sphere, ecology; in the field of

fundamental research it is characterized by a range of indicators from the spread of already known knowledge and best practices to fundamental changes in science, technology, economy, in in the field of applied research — from use at a separate enterprise to application within the national economy as a whole, in the innovation field — from the sale of products on the local market to entering the world market);

— objectivity (sign — the degree of validity of the result of scientific research; level — from inconsistency to complete conformity of the evaluation of the result);

— evidentiality (sign — nature of the information used, methods of its processing, methods of obtaining it);

— accuracy (mainly for applied research: a sign — compliance of the model, test sample with the standards).

the named criteria are reflected in the system not only qualitative (level of novelty, compliance of the obtained results with the world scientific and technical level), but also quantitative indicators, namely:

— the number of state and international prizes, awards, honorary titles received by the institute or its employees;

— the number of organized scientific events (conferences, seminars, congresses, symposia) and published abstracts of scientific reports based on their results;

- quantity scientific articles, scientific reports, scientific monographs, textbooks, training aids;

— recognition of scientific achievements by the international scientific community (inclusion of the results of scientific research (ND) in international encyclopedic publications, etc.);

— the number of doctoral students and post-graduate students who participate in the implementation of ND, as well as those trained in the process of implementation of ND;

— execution of work within the framework of an international project on a competitive basis;

— availability of positive expert opinions and reviews on the obtained results of ND;

— the number of applications for obtaining protective documents on intellectual property rights.

The following criteria for evaluating the results of scientific activity belong to the second group:

— theoretical and methodological (determines the degree of impact of these results on the system of knowledge about society);

— social and practical (determines the degree of influence of the results on social practice);

— value-cultural (determines the degree of influence of the results on the culture of society).

Evaluation indicators according to theoretical and methodological criteriaare: 1) strengthening and development of existing theoretical traditions;
2) the appearance of new theoretical constructions (the novelty of the latter implies that they explain new social phenomena, become a source of new schemes, approaches, methods, have prognostic potential and become a basis for formulating new hypotheses, are a means of testing, confirming and improving existing theories).
Evaluation indicators according to social and practical criteria:
1) contribution to the strengthening and protection of social order by improving existing social technologies and strategies;
2) contribution to ensuring balanced and gradual social transformations through the development of new social technologies and strategies.
Evaluation indicators according to the value-cultural criterion: 1) uniqueness of research results;
2) contribution to strengthening the traditional value foundations of social life (their preservation and development through cultural and ideological innovations).
final provisions
10. The implementation of the nationwide procedure for evaluating the results of scientific activity involves the development and approval at the legislative level of an information and analytical system for the implementation of constant monitoring of the effectiveness of scientific research.
Conclusions and prospects for further research. Summarizing the above, we note that the domestic regulatory framework for evaluating the effectiveness of scientific activity requires a balanced and unambiguous regulation of this process in terms of the interpretation of the forms of the results of scientific research, as well as the criteria and indicators for direct evaluation proposed for further use. Standardization of both methodological recommendations regarding the procedure for evaluating the results of scientific activity and the organizational mechanism of its implementation will make it impossible to consider and discuss those approaches to reforming the scientific field, the appearance of which is determined exclusively by the political and economic situation.

Materials for self-control:
AND. Questions for self-control:
B. Test tasks and tasks

Summing up.

List of recommended literature

Main:

1. Gutorov O.I. Methodology and organization of scientific research: study guide. Kharkiv: KHNAU, 2017. 272 p.
2. Danilyan O.G., Dzoban O.P. Organization and methodology of scientific research: teaching. manual Kharkiv: Pravo, 2017. 448 p.
3. Degtyarev A.V., Kokodiy M.G., Maslov V.O. Fundamentals of scientific research: a study guide. Kharkiv: KHNU named after V. N. Karazina, 2016. 78 p.
4. Kostyukevich V.M., Konnova M.V. Methodology of scientific research: study guide. Vinnitsa. 2017. Vol. 172.
5. Malyhina V.D. Methodology of scientific research. Rivne. 2016. 247 p.
6. Methodology of scientific research: teaching manual. / V.I. Zatserkovnyi, I.V. Tishaev, V.K. Demidov – Nizhyn: NSU named after M. Gogol, 2017. – 236 p.
7. Methodology of scientific research in medicine: teaching. manual / V.D. Babajan, N.S. Bakumenko, O.I. Kadykova and others; under the editorship P.G. Kravchuna, V.D. Babajana, V.V. Meat eater. – Kharkiv: KhNMU, 2020. – 260 p.

Additional:

1. Ilyashenko T.O. Problems and prospects of financing education and science in Ukraine in the conditions of the economic crisis / t.o. Ilyashenko, Acting radionova // Mechanism of economic regulation. — 2010. — No. 1. — p. 223—228.
2. Hirsch JE An index to quantify an individual's scientific research output. PNAS. 2005. 102(46): 16569—72.
3. Royal Netherlands Academy of Arts and Sciences: Quality indicators for research in the humanities (Interim report by the Committee on Quality Indicators in the Humanities, May 2011). http://www.researchtrends.com/issue-32-march-2013/evaluating-the-humanities-vitalizing-the-forgotten-sciences/.
4. Dubrovina L.A. Materials on the trends of world science in the field of evaluation of the effectiveness of the activities of scientific institutes, units, individual scientists and discussions in humanitarian science. Analytical report. K.: NAS of Ukraine, 2014.
5. Kenyon T. Defining and measuring research impact in the humanities, social sciences and creative arts in the digital age. Knowl. Org. 2014. 41(3): 249—57.
6. Declaration of the American Society for Cell Biology, December 16, 2012. http://www.ascb.org/dora-old/ files/SFDeclarationFINAL.pdf.
7. Science and Technology in America's Reinvestment — Measuring the Effects of Research on Innovation, Competitiveness and Science. https://www.starmetrics.nih.gov.
8. Sarli CC, Carpenter CR Measuring academic productivity and changing definitions of scientific impact. Missouri Medicine. 2014. 111(5): 399—403.

Electronic information resources:

1. Best Evidence. URL: http://www.bestevidence.com/
2. BritishMedicalJournal. url http://www.bmj.com/specialties/evidence-based-practice

3. CanadianMedicalAssociation. URL: http://www.cma.ca/
4. Center for Evidence-based Medicine at the University of Oxford. URL: http://www.cebm.net/
5. Clinical Evidence. URL: http://clinicalevidence.bmj.com/x/index.html
6. Cochrane Collaboration open learning material for reviewers. URL: http://www.cochrane-net.org/openlearning
7. Cochrane Library. URL: http://www.thecochranelibrary.com/
8. Current Controlled Trials. URL: http://www.controlled-trials.com/mrct
9. eGuidelines. URL: http://www.eguidelines.co.uk/
10. Evidence-Based Medicine. URL: http://ebm.bmj.com/
11. Canada Clinical Guidelines Database. URL: http://www.phac-aspc.gc.ca/
12. JAMAEvidence. URL: http://www.jamaevidence.com/
13. Medscape. URL: http://www.medscape.com/
14. National Institutee for Clinical Excellence. URL: http://www.nice.org.uk/
15. PRODIGY (Clinical Guidance). URL: http://prodigy.clarity.co.uk/

Practical lesson No. 13

SUBJECT: "Documentary sources. Organization of reference and information activities" - 2 hours

Goal:familiarization with the features of information support of scientific research, as well as the procedure for processing and analyzing their results.

Basic concepts:

Term	Definition
Automated information and search system	- a set of linguistic, algorithmic and technical means intended for automatic storage, search and issuance of the necessary information.
Automated system of scientific research	is a hardware and software complex based on toolscomputing equipment, intended for holdingscientific researchor complex tests of samples of new technology based on the acquisition and use of models of researched objects, phenomena and processes.
Bibliography	- the field of knowledge about the methods and methods of compiling indexes, reviews of printed works, lists.
Bibliographic guide	- a list of bibliographic records, that is, information about a book or an article from a newspaper, magazine, collection of works, etc., organized and combined according to a defined principle.
Library	–a cultural and educational institution that collects printed and handwritten materials, processes them and displays them in catalogs, organizes their correspondingstorage, saving and serving their readers.
Library file	- a collection, a set of cards with a description of the literary sources available in the library, united, systematized and placed in a certain order.
Library catalog	- a list of publications available in the library, which reveals the composition and content of the library fund and promotes its better use.
Information search language	-artificial language, intended for expressionsemanticaspects of information sources (most often,documents) andrequestsin a form suitable for implementationinformation search.
Information	- a set of information (messages, data) that determines the extent of our knowledge about certain phenomena, events and their relationships.
Scientific document	- is a material object that contains scientific information with a certain logical completeness and is intended for its storage, transmission and use.

Actuality of theme

The basis of any scientific research is information - a collection of information (messages, data) that determines the extent of our knowledge about certain phenomena, events and their relationships.

The quality and effectiveness of information in scientific research is determined by the following criteria: purposefulness, value, timeliness, reliability, sufficiency and complexity (completeness), speed, discreteness, continuity, frequency of receipt, deterministic nature, accessibility (understandability), method and form of presentation.

Plan

I. Organizational moment (greetings, checking those present, announcing the topic, the purpose of the lesson, motivating students to study the topic).
II. Control of basic knowledge: Theoretical questions for the lesson:

III. Formation of professional skills and abilities. Practical works (tasks) performed in class:

- Disclosure of the concept and types of bibliographic sources of information;
- Organization of information collection;
- Documentation of information.

Topic content:

The basis of any scientific research is information - a collection of information (messages, data) that determines the extent of our knowledge about certain phenomena, events and their relationships. This definition is used in a broad sense of the word. In the narrow sense, information is information that is the object of processing, transmission and storage. Information is the main concept of cybernetics - the science of general regularities in the process of managing and transmitting information.

The quality and effectiveness of information in scientific research is determined by the following criteria: purposefulness, value, timeliness, reliability, sufficiency and complexity (completeness), speed, discreteness, continuity, frequency of receipt, deterministic nature, accessibility (understandability), method and form of presentation.

First of all, the researcher must determine the purpose of the information, since the same information can be used for different purposes: creating new concepts, establishing and solving search problems, etc. The value of information is determined by the economic effect of its use. The practical task facing the researcher is to determine what information he needs. At the same time, it is necessary to exclude redundant information that is not directly related to the object of research.

All elements of research activities are closely related to preservation, processing and storage of information (Fig. 1).

Fig. 1 Connections of research information activities

According to foreign sources, the intensity of information aging is more than 10% per day for newspapers, 10% per month for magazines, and 10% per year for books and monographs. In addition, information for the researcher is the subject and result of his work. Understanding and processing the necessary information, the researcher produces a specific product - qualitatively new information. At the same time, it is estimated that about 50% of the researcher's time is spent searching for information.

The role of informationimportant at all stages of research: when choosing and specifying a topic, studying the history of the issue, creating a hypothesis, etc. But information plays the biggest role in shaping the content of future work. Depending on the composition and quality of the collected information, not only the work plan, but also the direction of the research itself may change. In this regard, not all information can be useful for this study. That is why the selection of the most significant information for this study, the ability to determine its place in it are necessary conditions for the correct selection of information content.

The main role of information in research is to exclude subjective conclusions, to provide an opportunity to obtain an optimal solution to the problem. The level of scientific research depends on the reliability, the degree of use of information and the ability of the researcher to process the received information. A more detailed study of these connections requires a solution to the question of what functions the information should perform. Such functions are informative, stimulating and orienting.

The essence of the informative function is to provide knowledge, information about this or that object and subject of research. The implementation of the stimulating function allows researchers to come up with a new question, a new solution to it, in order to improve practice. The orienting function is reflected in regulations, norms, and target guidelines, which researchers perceive as mandatory social regulation in order to achieve the necessary scientific results in the shortest possible time. All functions of information are interconnected and in combination contribute to the development of creativity in research activities.

Information is classified according to various features:

According to the degree of scientific novelty, the following are distinguished:

a) new information reflecting the novelty of the proposed solution to a theoretical or practical task;

b) relevant, which was previously contained in analogues (for example, in methodical instructions).

According to the purpose, the following are allocated:

a) reported information obtained in the research process;

b) management information that is necessary for making management decisions.

According to the duration of the period during which information remains relevant and is used for decision-making, information is classified into:

a) theoretical (scientific) information is the results of fundamental or applied scientific research in various fields, which are widely used in production and management;

b) strategic - information that remains relevant for long periods (10-15 years): long-term plans and forecasts, data on slowly changing objects, design documentation;

c) tactical (conjunctural) - information with a period of relevance of 2-3 years or less;

d) operational - information that is relevant within one cycle of operational management.

Depending on the object that displays the information, it can be:

a) natural science - characterizes the connections between natural objects;

b) technical-technological - reflects the relationships between objects of nature that relate to technology and technical means;

c) economic - reveals relations between people in the process of production, distribution, exchange and consumption;

d) socio-political - information about social, political, ideological relations between people.

Depending on what is displayed in the object, the information is of the following types:

a) legislative acts, government documents, regulations, instructions of various management bodies;

b) data from demographic and sociological studies;

c) materials of economic theories;

d) data on the level of development of equipment, technology and trends in their development;

e) information about economic relations;

g) information on production processes;

f) information on production factors;

g) information on macroeconomic processes.

In scientific research on management problems, mainly economic information is used - information that reflects the processes of production, distribution, exchange and consumption of material goods and services. In the most general form, sources of economic information can be classified into the following groups:

- documents of the government and authorities;
- regulatory materials;
- financial reports and statistical materials;
- planning, accounting, control and analytical data;

- archival materials;
- materials of questionnaire surveys and personal observations;
- materials of conferences, symposia, meetings;
- scientific documents (literary sources).

The scientific-theoretical and methodological basis of scientific research in the economy are the documents of the government and authorities on management issues in the conditions of the formation of market relations. First of all, this includes normative documents.

All regulatory materials, depending on the source, can be grouped as follows: Decrees of the President of Ukraine, resolutions of the Verkhovna Rada of Ukraine, resolutions of the Cabinet of Ministers of Ukraine, orders of ministries and departments, administrative bodies. By nature and branch affiliation, these regulatory materials are divided into departmental and interdepartmental. The normative materials contain data that determine the general direction in the development of the national economy, its separate complexes: agro-industrial, industry, construction, etc. Knowledge of the general direction allows you to correctly determine the object of research, the target direction of research works. Among the regulatory sources, interdepartmental regulations, which contain methodological guidelines for several industries, are of great importance.

Reporting and statistical materials are an important source of information when conducting scientific research.

Reporting materialsis a system of forms and indicators. Reporting indicators are built in relation to the requirements of the management system. They characterize the results of the work of individual links of the national economic complex. Currently, there are about 500 forms of operational, statistical and accounting reporting.

Operational materialsare drawn up directly during the execution of economic transactions and contain details based on the tasks and methodological requirements of accounting and statistics.

Statistical materialsdesigned to solve the task of information display of the entire national economy and its links. They are divided into three types: statistical reporting, reviews, collections.

Accounting materialsallow you to get information about individual enterprises and organizations. They are completely based on operational accounting data.

Planning, accounting, control and analytical materials include: plans, forecasts of the economic and social development of the enterprise, calculations to justify the need for raw materials, personnel, payroll, etc., balance sheet, primary documents for accounting of economic activity, accounting and statistical reporting on the work of the enterprise, association, etc.

In cases where statistics and accounting cannot be directly based on primary documents, they organize special continuous, selective and monographic questionnaire surveys.

One of the most important types of research sources are literary and, above all, scientific documents. A scientific document is a material object that contains

scientific information with a certain logical completeness and is intended for its storage, transmission and use. A collection of scientific documents constitutes scientific and technical literature. This is the material form of existence of science.

The main literary sources of scientific and technical information are:

- books (monographs, textbooks, training aids),
- periodicals (magazines, bulletins, works of institutes, scientific collections),
- normative documents (standards, construction norms and rules, technical instructions, instructions, etc.),
- catalogs and price lists,
- patent documentation (patents, copyright certificates),
- reports on research and development works,
- information publications (NTI collections, analytical reviews, information sheets, express information, exhibition brochures, etc.),
- translations of foreign scientific and technical literature,
- materials of scientific, technical and industrial meetings,
- dissertations and abstracts,
- production and technical documentation of organizations (reports, acts of acceptance of objects into operation, etc.).

Scientific documents are divided into:

1) primary, which contain direct results of scientific research, new scientific information (books, articles, brochures, monographs, dissertations);

2) secondary, which contain the results of analytical-synthetic and logical processing of scientific information of primary documents (information publications, catalogs, card files, bibliographic manuals and reference literature).

Primary documents can be published or unpublished. Primary published documents are printed works that have undergone editorial and publishing processing and are intended for the transmission of information contained in them (books, brochures, monographs, periodicals, scientific and technical documentation). Primary unpublished documents are scientific and technical reports, dissertations, deposited manuscripts, information maps, design information, preprints, etc. As a rule, unpublished works are presented in manuscripts or reproduced in a small number of copies.

Depending on the method of presentationall information contained in scientific documents is divided into signal, relevant, bibliographic and new (main).

Signal information includes: title page, abstract, headings, content, etc. It helps the researcher to navigate the content of the scientific document.

Relevant informationcontained in the text, notes, author's speeches and clarifies individual provisions.

Bibliographic information- this is a list of literary sources used by the author, indicating the author, title of his work, place of publication, publisher and year of publication.

New (main)information is the direct content of the work, new provisions put forward by the author, a system of proofs, rules, formulas.

Organization of collection of practical information at enterprises involves:

1) correct choice of the object of examination;

2) justified definition of the system of indicators to be collected during the monitoring process;

3) development of methods for obtaining certain indicators;

4) correct documentation of examination data.

The object of examination- is an object or a phenomenon of reality, which is subject to research in order to learn its essence, patterns of development and further use of the results of knowledge in practice. The objects of examination can be products of work, processes, phenomena, events in nature or society, individual aspects of cognitive processes, layouts or models that reproduce the essential aspects of the objects and phenomena being studied, or a set of units being studied. The aggregate unit is a constituent element of the object of observation, which is the carrier of the studied features.

The process of selecting the survey object is associated with significant labor costs and is quite complex. The purposefulness and effectiveness of the scientific examination depends on the correctly chosen object of examination. Therefore, effective scientific research involves certain features of the object of examination, which should consist of the following:

1. The presence of unknown properties of the object at the time of the problem situation.

2. The dynamism of the object of examination: scientific research cannot lead to the final discovery and study of the properties of objects, which is related to the relative nature of all knowledge and its continuous variability. Therefore, it is important to clearly define the conditions for selecting the properties of the object at the beginning of the scientific work.

3. Divisibility of the object of examination: any research work can be divided into separate, smaller parts, the questions of which are carried out in separate stages and stages.

4. Heredity of the object of examination. In the process of research, new problems arise, therefore, the results of any scientific work should be evaluated according to the composition of the formulated new problems and requirements for the initial conditions of their solution.

The main volume of information during the writing of term papers and diplomas is collected by students, as a rule, in organizations and enterprises. It is in this case that the source information is most subordinate to the purpose and tasks of their research. In terms of breadth and depth of information, this source significantly exceeds others. An enterprise (organization) that works under normal conditions, i.e. does not appear to be lagging behind or the most advanced, is chosen as the object of research. Separate scientific student works are performed on the basis of the definition of the totality of enterprises (organizations). The selection of these enterprises (organizations) takes place on a selective basis.

The basic idea of the sampling method is that a part is selected from the whole, which is called a sample population. The entire population that is studied and from which a certain number of units (sample) is selected is called the general population.

When deciding on the application of the sampling method, the researcher must comply with the requirements of ensuring a sufficient number and quality of visibility (representativeness) of the survey objects. Representativeness means the correspondence of the characteristics of the sample population to the characteristics of the general population. Quantitative errors of representativeness arise as a result of the illogical nature of surveys, that is, the selection of units does not fully reproduce the general population. Sampling can be carried out by the method of resampling or without resampling.

It is quite difficult to carry out dispersion calculations for the entire general population. Therefore, variance calculations in the presence of data on the average arithmetic value of the characteristic under study can be carried out based on the data of not the entire collection of survey units, but only a part of it.

The confidence coefficient (г) depends on the probability by which it can be claimed that the margin of error (Дх) will be guaranteed within the specified limits. The larger the value of the confidence coefficient, the higher the probability that the margin of error will be guaranteed in a larger number of survey units. The margin of error is chosen arbitrarily, that is, depending on the nature and degree of required accuracy of the information. For example, when forming a sample to collect information on product sales, you can get a margin of error of up to 10%, and a confidence coefficient equal to 2.

The main ways of selecting units from the general population are as follows.

A random sample- the simplest type of sampling, which forms the basis of more complex survey methods. To obtain a random sample, the studied material is first divided into selection units, then the necessary number of units is randomly selected from the entire population of these units. In random sampling, each unit has the same chance of being in the sample.

Mechanical samplingbased on mechanical selection. At the same time, units of the population (groups, enterprises, organizations) are preliminarily placed in the list in a certain order, for example, according to the decrease or increase of some indicator, and then the units are mechanically selected after a certain interval. Thus, the totality seems to be divided into parts consisting of the same number of units, and a unit is taken from each part. The value of the interval is found by dividing the number of units of the general population by the number of units to be selected.

A typical sampleis based on the selection of units for a sample survey not from the entire general population as a whole, but from its typical groups formed by some characteristic that significantly distinguishes one group from another. A certain number of units are allocated within each typical group as a result of random or mechanical selection.

Serial or nested samplingis a method of selection in which the sample population is formed by selecting entire series at once, rather than individual units. In the selected series, all units of the population are examined without exception. Direct selection of series is done by means of random or mechanical selection.

In addition to the quantitative representativeness (representativeness) of the survey object, qualitative representativeness should be ensured. The information obtained on the basis of the sample should be used to characterize the entire general

population, develop recommendations aimed at achieving better performance results, forecast individual indicators. At the same time, the received information should cover all aspects of the activity of the object of examination and comprehensively characterize them.

When organizing the collection of practical information, an important role is played by the reasonable definition of the system of indicators to be collected. Any indicator gives a quantitative characteristic of this or that activity, object, process and is the result of measurement or calculation. Interrelated indicators that comprehensively characterize the object (process, activity) in accordance with the purpose of the study form a system of indicators.

The indicator consists of a base, which is always a numerical expression. A basic feature is given to the base, which indicates what or to whom the base refers. In addition to the main feature, there may be clarifying features: accompanying and specifying.

Signs that reveal and characterize the main indicators are mandatory, since without them it is impossible to give a comprehensive description of a numerical expression or basis. Optional (hidden) signs are not registered in daily work and may not be reflected in documents (for example, moisture content of sugar or flour, calorie content of coal).

According to the expression of the numerical sign, indicators are divided into absolute and relative. Absolute values in statistics characterize the sizes, volumes or levels of social phenomena and processes in units of weight, volume, length, area, value. All units of measurement of absolute values are natural and valuable. Natural units of measurement, in turn, are:

a) simple ones that correspond to the physical properties of measured quantities (kilograms, liters, meters);

b) components (kilowatt-hours, ton-kilometers);

c) conditional, used to generalize data on the release of the same type of products in different capacity units (for example, canned goods are recorded in conventional cans with a net weight of 400 g) or generalization of data on different types of phenomena with the same consumer purpose (for example, when burning 1 kg of coal, 7,000 kcal of energy).

The most universal are value units (hryvnias, thousands of hryvnias), which can be used to express everything and summarize it in money. All absolute values are divided into individual and general values, they can be obtained in the process of statistical observation or in the process of statistical compilation. Individual absolute values are obtained in statistical observation during the quantitative assessment of the characteristics being studied in individual units of the population. Summarizing absolute values are calculated in the process of statistical aggregation and grouping of individual absolute values.

Relative valuesin statistics, there are the results of dividing two initial values that characterize this or that phenomenon or process. When calculating relative values, it is possible to compare both the same type and different types of values that are interconnected.

According to stability, indicators are divided into permanent and variable (one-

time). According to their purpose, they are working and auxiliary, which are the basis for calculating workers.

According to the stages of formation, indicators are divided into primary, intermediate, combined and effective.

The collection of indicators in organizations and enterprises is carried out in several stages.

At the first stagefor each of the issues being studied, the circle of necessary indicators is determined and a list of them is compiled. At the same time, indicators of source information (individual) and analytical (generalizing) are distinguished. The list of indicators is determined by the research program.

At the second stageall initial indicators for each question of the topic are grouped into a consolidated list. At the same time, repeatability, interrelationship and the possibility of obtaining analytical (generalizing) indicators are taken into account.

At the third stagefor each indicator, the sources of information are determined, which, depending on the method of obtaining them, are classified into the following: statistical reporting and accounting, field surveys of institutions, special (personal) surveys, survey materials of other authors.

The method of collecting indicators in each of the listed sources of information has certain features. The least time-consuming is the collection of indicators found in the materials of statistical reporting and accounting. The collection of these indicators is related to the determination of the name or number of the reporting form, the accounting book and the number of the corresponding line, the period for which the indicators are collected, and the units of measurement.

The collection of indicators by means of on-site inspection of enterprises is related to the determination of the type of building, mode of operation, number of floors, calculation nodes, etc. At the same time, the period of field survey should be similar to the period of collecting statistical reporting or accounting indicators, and the identity of measurement units should also be ensured.

The process of collecting indicators by conducting special (personal) surveys is quite time-consuming, with the help of which you can get information that is not fixed anywhere. For example, this is the determination of buyers' preferences for certain products, the amount of time they spend on shopping, the number of customers served during certain business hours, etc. At the same time, the method of obtaining such indicators includes: finding ways to collect indicators (questionnaire surveys, timing measurements, photography of the working day, filming or photography); classification of studied processes; determining the number of observations.

Questionnaire or oral surveys of buyers or experts (representatives of organizations and enterprises) occupy a special place in special surveys. With their help, you can relatively quickly accumulate the necessary information and obtain information that cannot be gathered in other ways. Most often, it is the detection of the degree of provision of the population with certain types of goods, the detection of factors that shape demand. It is possible to prepare and successfully conduct a questionnaire survey with an accurate scientific approach to defining the task that will be solved with its help.

At first glance, collecting indicators using survey materials by other authors seems quite simple. However, it requires a careful review and processing of literary sources, which is also associated with considerable expenditure of the researcher's time.

Collection and selection of materials for researchin terms of importance and labor intensity, they occupy a rather important place in it. Many scientists rightly claim that gathering ready-made information on a research topic takes no less than two-thirds of the total time spent on its development.

It is most convenient and correct to start collecting materials after a preliminary familiarization with the available sources of information and the history of the researched issue has been completed, the current state of the problem has been clarified, all relevant literature has been identified, its bibliography has been compiled, and a preliminary calendar plan for scientific research work has been developed.

When collecting materials for scientific research, it is necessary to precisely and consistently adhere to such basic principles as purposefulness, conscientiousness, and comprehensiveness.

In no case should a scientist deviate from the goal he set in his plan. All other facts should be postponed until the end of work on the topic. At the same time, those facts that contradict the hypothesis of the theory must be conscientiously recorded and analyzed. They should never be falsified in favor of one's own hypothesis, fit the facts or a pre-made theory. Comprehensiveness implies the ability to see reality in all its diversity and in all its contradictions, not to miss anything that is revealed during observation or experiment.

Using these principles, the researcher carries out an information search according to the plan of developing the topic of the scientific research work. As already noted, information search is carried out both before and after choosing a research topic. Its purpose is the analysis of information on the topic, clarification of the state of the issue (compilation of an analytical review), clarification of the topic if necessary, substantiation of the purpose and tasks of scientific research. Information search consists of the following stages: direct search, selection and processing of materials.

Search and selection of materials takes an important place both when choosing a research topic and after approval of the topic plan. As for the selection of literary sources and compilation of the bibliography when choosing a research topic, this stage of research work is connected with the initial processing of the material. After approval of the topic plan, work with literary sources continues, that is, the researcher begins their in-depth study and processing. In the process of further study of the literature, the scientist quite often comes across a reference to new sources for him. Therefore, he has to resort to additional research in the next stages of research work. However, the search for material for the development of a topic cannot continue indefinitely. In order to narrow the scope of the search, the information must be analyzed (processed) and the most necessary must be selected from it. That is why it is so important to follow the following rules for selecting literature:

1) carefully study the bibliography;

2) be as conscientious as possible about the selection of materials;

3) get acquainted with the literature not in direct, but in reverse chronological order;

4) systematically review periodical literature, especially magazines;

5) pay significant attention to the study of primary sources;

6) independently analyze statistical materials;

7) equally carefully study both the material that confirms the research concept and the one that contradicts it.

After studying the literature, you should turn to the study of practice

INin the process of collecting material, one cannot fully trust literary sources, limit oneself to work only in the library, in the laboratory of the department. The researcher should turn to the study of the experience of practical activity. The connection between theory and practice should be carried out with the greatest effect long before the implementation of the results of the completed research. A researcher who is well acquainted with practice will take into account all the features of the technology of analytical work.

The student should familiarize himself with materials reflecting the activities of health care institutions, plans, forecasts, reports, certificates, explanatory notes, archives, current correspondence, instructions, orders, etc. The more actively he will participate in the life of the institution during the period of educational and pre-diploma practices, the broader his worldview will be, and, therefore, the more effective the development of the research topic will be.

The central place in the collection of material is the collection of facts or factual information. A fact or factual material is something that really exists and is firmly established: events, names, titles, dates, quantitative and qualitative indicators of research.

Facts and factual information are the basis of any scientific research. The latter is formed in the economic accounting system using statistical, operative and accounting methods, which provide continuous and continuous documentation of economic processes. Accounting allows not only to record the facts of economic activity and accumulate factual information, but also to influence the improvement of this activity through the management system. Accounting data are transformed into reporting, creating qualitatively new factual information that is summarized in the state statistics system and reflects the results of socio-economic development.

The collection and processing of factual information is subordinated to the main purpose of the study - the development of scientific recommendations on rational management, the identification of reserves for increasing the efficiency of organizations. In accordance with this goal, the criteria for the methodology of using factual information in the research should be substantiated reliability of scientific results, irrefutability of facts, their study as a whole, concreteness and really scientific good faith of their interpretation. Therefore, this technique includes such procedures as data selection, verification of their reliability, research and use in the evidence system.

Data selection- is a selection of indicators that characterize the object of research, correspond to its purpose and tasks. To search for them at the modern stage,

electronic computing equipment is quite often used.

Validation of datain terms of organization, it is associated with such techniques, which are used to group and summarize information that characterizes economic phenomena. At the same time, attention should be paid to the study of secondary data on economic activity.

Data research (processing)., which are grouped in the reporting system of all levels of generalization, consists in revealing summarized information about the deviation of the actual indicators of economic activity of organizations from the planned (forecast). To substantiate the results of the study, a secondary grouping of indicators obtained during the study of calculation data for each investigated object is carried out. Analytical (estimated) data on economic transactions are taken from accounting and statistical media (documents).

In the economics of the organization, a carefully thought-out personal observation of the activities of organizations is a necessary part of the study. It enlivens and enriches the theoretical study of reports, statistical materials, printed literature, etc. To organize the collection of materials during personal observation, various forms that require certain knowledge and experience can be used: sample surveys, expert evaluations, questionnaires or oral surveys, photographs of working hours, filming, photography, etc. They are, of course, taught in textbooks on statistics and marketing, and in this case there is no need to describe and evaluate them.

Personal contacts with specialists, representatives of related disciplines (professions), and colleagues are of great importance in research work. Personal contacts are a rather important condition for increasing the effectiveness of scientific work. They can be both oral and written (rewriting). When a researcher shares thoughts and plans with a knowledgeable specialist, he has the opportunity to clarify a number of questions. Recognition of ideas and thoughts encourages him and encourages him to work. In cases where there is no relevant specialist on site, you can apply in writing to well-known specialists in another city. The need for a concise and clear statement of opinion contributes to clarifying the researcher's scientific position. Written contacts ensure the exchange of experience and prevent duplication of research. Both types of face-to-face contact are most effective with individuals working on the same or compatible topic. The advantages of such communication make it possible to obtain the necessary additional information on the research topic, clarify it, rethink and, if necessary, change the direction and individual questions of the research topic, obtain information that cannot be obtained in any other way. In modern conditions, contacts with specialists are significantly accelerated through the use of e-mail and information systems.

Collected information from various sources (literature, practice, personal observations and contacts) is documented. In terms of form, it can be textual, tabular, graphic (schemes, graphs, drawings), audiovisual (sound recordings), films, photographs and other documents. In the economy, tabular informative documents, both consolidated and separate, are often used, especially when the list of studied indicators is small. With a large number of indicators, several forms of documents are used.

Documentation of collected informationshould be carried out in the following

sequence. First, the indicators obtained from literary sources are derived, then - from the forms of statistical reporting, accounting and other materials of the activity of the basic researched enterprise, then - the indicators of its on-site and special (personal) observation and, finally, obtained during personal contacts with specialists.

Due to the rather large volume of processed information, it is advisable to subject it to machine processing on a computer. This significantly simplifies the process of processing information and reduces its labor intensity.

For the purpose of ease of storage and use, all types of informative documents are compiled in a certain sequence for each inspected object and stored in separate folders (files, diskettes). Folders are numbered and make a register of materials on the research topic.

Collected information in the process of scientific research is subject to careful processing. The entire collected material from the first to the last page is subject to processing - this is the primary continuous processing of the material. It should precede the writing of the text. With its help, you can imagine the overall picture of the entire work, thereby creating favorable conditions for writing the text at the appropriate scientific level.

This important stage of research work consists of several stages:

1) systematization of the material;
2) evaluation of the suitability of information;
3) checking the reliability and significance of information;
4) comparison of information;
5) construction of preliminary and final conclusions.

First, it is necessary to systematize the collected information, that is, to organize scattered facts, to create a coherent system of them in accordance with the purpose of the research. Systematization methods are classification and typology. Classification is the grouping of facts in aggregate according to quantitative characteristics, and typology - according to qualitative characteristics. In the process of collecting information, it should also be constantly systematized, i.e. always reread and organize the material in accordance with the plan for developing the topic. At the same time, as information is received, it should find its place in a certain paragraph of the work.

Primary information after continuous processing is subject to statistical or secondary processing. The essence of this processing consists in drawing up tables, series, diagrams, graphs (curves, diagrams, cartograms), calculation of average and relative values, indicators of variation and dispersion, correlations in factor analysis. Thus, new information is created.

In the process of systematization, information should be cleaned from unnecessary and duplicative and, especially, erroneous materials, i.e., assess the suitability of information from the point of view of the purpose of research work. If necessary, the material should be supplemented with additional data.

All accumulated and systematized information must be checked for its reliability and significance. Assessment of the reliability of information is a particularly responsible stage of its processing, which requires a high qualification of the researcher. One of the ways to determine the reliability of collected information is

its mathematical evaluation, which can be limited to a selective check of the most relevant elements - methods, formulas, logical reasoning. All insufficiently reliable information should be removed.

The main method of constructing scientific conclusions in the process of information processing is data comparison. A researcher in search of a solution to a problem must compare the known facts in different combinations until some combination becomes a possible solution. Such a decision is a preliminary conclusion, which should be critically reviewed in order to avoid wrongly solving the problem. In this regard, in order to obtain reliable scientific conclusions, one should focus as much as possible on the research topic and involve the maximum number of facts and ideas, be inquisitive and interested, and effectively use the results of the collective discussion of the collected information.

At the end, the researcher summarizes the work and formulates the final conclusions based on the preliminary conclusions, which often significantly expand the sources of information or, on the contrary, cut off unnecessary data. they are recommended to be formulated carefully, precisely, without overloading the justification with digital data. Final conclusions should be concise and meaningful. With their help, the reader should easily evaluate the work, the researcher should check it again.

In order to improve the process of scientific research, it is advisable to use appropriate automated systems.

Automated system of scientific research(ASND) is a software-hardware complex based on meanscomputing equipment, intended for holdingscientific researchor complex tests of samples of new technology based on the acquisition and use of models of researched objects, phenomena and processes.

The main task of ASND is to obtain qualitatively new knowledge about the researched process, object or phenomenon through:

- increasing the efficiency and quality of scientific research on the basis of obtaining and clarifying more complete models of the studied objects;
- reducing the time and complexity of scientific research.

The basis of ASND work is based on the principles of information exchange between the researcher and research equipment on a real-time scale. At the same time, ASND is entrusted with the following functions:

- collection of measurable information and its primary processing (algorithm of the research process);
- input of control information and control of experimental equipment;
- storing information and exchanging it with other computers.

The main stages of information processing on a computer in the ACS are:

- collection, transmission and preparation for input into the computer of primary information;
- input, accumulation and processing of information;
- output and transmission of information processing results to a person (researcher).

The efficiency of information processing depends on the quality of the set of operational programs and the design of the entire cycle of information processing

work on a computer. So, in particular, according to the batch processing method, a certain amount of information is combined into a packet for the purpose of research and transmitted through communication channels in one session. The researcher sets the appropriate tasks, the computer solves them and records them on the memory device. After the complete solution of the task or at the special request of the researcher (scientist), the computer issues an answer. The information processing procedure is carried out by standard means of the operating system, which greatly simplifies it, speeds it up and makes it possible to scientifically substantiate conclusions and proposals.

Information processing systems on computers in scientific research differ in some specifics. The sequence of its processing includes the following stages:

- setting tasks and compiling an algorithm for solving them, which should be carried out by a scientist (researcher);
- solving tasks and issuing processed information, which creates opportunities for proving hypotheses regarding a specific situation;
- identifying the causes of deficiencies and developing recommendations for their elimination;
- writing and summarizing conclusions.

The researcher's performance of the specified stages of scientific information processing requires him to have a good command of algorithmization techniques and setting tasks for their subsequent programming and solving on a computer by programmers, system engineers and other specialists in this field. The researcher should deeply study the information support of the information processing system, i.e. the entire available set of tools, methods, application program packages for building and processing the information fund.

5. Conclusions on the topic

The basis of any scientific research is information - a collection of information (messages, data) that determines the extent of our knowledge about certain phenomena, events and their relationships. Information in scientific research performs informative, stimulating and orienting functions.

*Information is classified*according to the degree of scientific novelty, purpose, duration of use, as well as the object and subject it represents.

Scientific studies on management problems mainly use information reflecting the processes of distribution, exchange and consumption of material goods and services.

One of the most important types of research sources are literary and, first of all, scientific documents - material objects that contain scientific information with a certain logical completeness and are intended for its storage, transmission and use. Scientific documents are divided into primary (published and unpublished) and secondary. Scientific literature is a collection of scientific documents.

*Organization of collection of practical information in organizations involves:*correct choice of the object of examination; reasonable definition of the system of indicators to be collected during the monitoring process; development of methods for obtaining certain indicators; correct documentation of examination data. Collected information in the process of scientific research is subject to careful

processing.

Materials for self-control:
AND. Questions for self-control:
B. Test tasks and tasks

Summing up.

List of recommended literature

Main:

1. Gutorov O.I. Methodology and organization of scientific research: study guide. Kharkiv: KHNAU, 2017. 272 p.
2. Danilyan O.G., Dzoban O.P. Organization and methodology of scientific research: teaching. manual Kharkiv: Pravo, 2017. 448 p.
3. Degtyarev A.V., Kokodiy M.G., Maslov V.O. Fundamentals of scientific research: a study guide. Kharkiv: KHNU named after V. N. Karazina, 2016. 78 p.
4. Kostyukevich V.M., Konnova M.V. Methodology of scientific research: study guide. Vinnitsa. 2017. Vol. 172.
5. Malyhina V.D. Methodology of scientific research. Rivne. 2016. 247 p.
6. Methodology of scientific research: teaching manual. / V.I. Zatserkovnyi, I.V. Tishaev, V.K. Demidov – Nizhyn: NSU named after M. Gogol, 2017. – 236 p.
7. Methodology of scientific research in medicine: teaching. manual / V.D. Babajan, N.S. Bakumenko, O.I. Kadykova and others; under the editorship P.G. Kravchuna, V.D. Babajana, V.V. Meat eater. – Kharkiv: KhNMU, 2020. – 260 p.

Additional:

1. Puzanova O. G. Information provision of evidence-based health care. Part I. / O. G. Puzanova, T. S. Gruzheva // Proof. honey. – 2014. – No. 4 (16). - P. 23-33.
2. Skakun M. P. Fundamentals of evidence-based medicine: monograph / M. P. Skakun. - Ternopil: Ukrmedknyga, 2005. - 244 p.
3. Chernobrovy V. M. Health, pre-disease, disease: medical and social aspects and assessment. Risk factors. Preventive medicine: a guide for graduate students, interns, general practitioners - family medicine / V. M. Chernobrovyi, S. G. Melashchenko, T. M. Tkachuk. – Vinnytsia: Planer, 2013. – 80 p.
4. Shulyak V. I. International experience of using an integrated clinical protocol in medical practice (literature review) / V. I. Shulyak // Ukr. honey. magazine – 2010. – No. 5 (79). - P. 41-44.
5. Howick J. The Philosophy of Evidence-Based Medicine / J. Howick. - Oxford: Blackwell-Wiley, 2011. - 238p.

Electronic information resources:

1. Best Evidence. URL: http://www.bestevidence.com/
2. BritishMedicalJournal. url http://www.bmj.com/specialties/evidence-

based-practice
3. CanadianMedicalAssociation. URL: http://www.cma.ca/
4. Center for Evidence-based Medicine at the University of Oxford. URL: http://www.cebm.net/
5. Clinical Evidence. URL: http://clinicalevidence.bmj.com/x/index.html
6. Cochrane Collaboration open learning material for reviewers. URL: http://www.cochrane-net.org/openlearning
7. Cochrane Library. URL: http://www.thecochranelibrary.com/
8. Current Controlled Trials. URL: http://www.controlled-trials.com/mrct
9. eGuidelines. URL: http://www.eguidelines.co.uk/
10. Evidence-Based Medicine. URL: http://ebm.bmj.com/
11. Canada Clinical Guidelines Database. URL: http://www.phac-aspc.gc.ca/
12. JAMAEvidence. URL: http://www.jamaevidence.com/
13. Medscape. URL: http://www.medscape.com/
14. National Institutee for Clinical Excellence. URL: http://www.nice.org.uk/
15. PRODIGY (Clinical Guidance). URL: http://prodigy.clarity.co.uk/

Practical lesson No. 14

SUBJECT: "Basics of scientific ethics and work organization" - 2 hours

Goal: To master the basics of the ethics of scientific research.

Basic concepts:

Term	Definition
Conflict of interest	— thisa situation in which the judgments, conclusions and actions of an individual are influenced by numerous conflicting interests that are opposite in form and content. In such situations, it is necessary to find ways to maintain a balance between personal autonomy (independence), professional integrity and accountability.
Conflict of obligations	is a special form of conflict of interests that arises in relation to the ratio of time spent and duties and obligations in a scientific organization.
Ethics of science	is a field that studies the specifics of moral regulation in the scientific field, as well as the synthesis of values, norms and rules in this field. It encompasses two sets of problems: the first is related to the regulation of relations within the scientific community itself, and the second is between society as a whole and science.

Actuality of theme

Every scientist who has connected his life path with scientific activity aimed at the creation and progress of knowledge with the help of scientific methods, achieving high scientific results, must adhere to certain principles of behavior in the scientific community, determined by a set of moral and ethical values inherent in this type creative work. their content has developed historically and is being clarified and improved by the scientific community itself in accordance with the conditions of modernity in connection with the emergence of new ethical problems in science as a result of social transformations.

Plan

I. Organizational moment (greetings, checking those present, announcing the topic, the purpose of the lesson, motivating students to study the topic).

II. Control of basic knowledge: Theoretical questions for the lesson:

III. Formation of professional skills and abilities. Practical works (tasks) performed in class:

- The ethical code of the scientist and its main task;
- The main fundamental values around which the norms of science are built;
- Scientific ethics in scientific research.

Topic content:

Ethical issues in science can arise for various reasons: as unrealized ideas that should be put into practice; as conflicts, where you need to try to be a mediator; as dilemmas to be understood and resolved; as questionable behavior that needs to be limited and corrected; as unprofessional behavior etc.

In the last quarter of the 20th century the subject circle of the ethics of science was defined as the understanding of those norms that should guide not only the relations of scientists within the scientific community or determine the higher cognitive values of science, but also those that allow or prohibit a certain intervention of science in nature and man.

If we talk about the formation and confirmation of the status of the problems of the ethics of science in the structure of the philosophy of science, then the 70s should be defined as the time when the problems of the ethical content of scientific research in certain branches of the economy attracted the attention of the world scientific community.

The discussion of such questions enabled philosophers and methodologists of science to decide what the ethical problems of science are, their analysis and understanding are presented in the works of I. Frolov, B. Yulin. S. Pastushny, R. Karlinska, A. Mamzin and other scientists of the 70s and 80s of the 20th century.

On the basis of these studies, ethical problems were identified, which are related to the awareness that the research activity of a scientist is influenced by socio-cultural factors, in particular moral norms.

In the consciousness of the world scientific community, the status of ethical problems of science as a result of the influence of science on society and nature has been established. A striking example is the research of the famous Western philosopher of science E. Agazzi. Deep ideas in this regard were formulated by K. Apel, in the domestic and in the Western philosophy of science it is recognized that in real science, research activity is guided by certain worldview and methodological guidelines, faith in the truth of the ideals of science, moral principles. The scientist's awareness of the necessary norms is realized in the fact of the scientist's responsibility of a generally human nature.

On the basis of the above justifications, the concept of scientist's responsibility is introduced in the ethics of science. Academician N. Engelhardt, who deeply considered the ethical problems of science, noted that a scientist in his work naturally bears responsibility for the general human nature. He is responsible for the "full value" of the scientific product he received; he is expected to be flawlessly demanding of the reliability of the material, correctness in using the works of his colleagues, logic of analysis, and the validity of the conclusions. According to V. Engelhardt, this is the basic responsibility of a scientist, his personal ethics.

Therefore, personal ethics is the responsibility for the objectivity of the result. However, according to V. Engelhardt himself, this is only elementary ethics, that is, an inviolable rule. But the ethics of science is not exhausted by it alone.

Scientific ethics is a set of established and recognized by the scientific community norms of behavior, rules, morals of scientific workers engaged in the field of scientific and technological and scientific and pedagogical activities. Scientific ethics combines:

– rights and obligations of scientific workers;
- scientific honesty;
– conflict of interests;
- compliance with ethical norms and standards;
- submission of official complaints.

Rights and obligations of scientific workers

The "Recommendation on the status of scientific workers", adopted by the 18th UNESCO General Assembly in Paris on November 20, 1974 and ratified by the governments of most countries of the world, made a significant contribution to the protection of the rights of scientific workers and the promotion of scientific progress.

Its main provisions are quite relevant even today, although the goals have not yet been fully achieved in many countries, in particular in Ukraine. This document states that scientists are called to play an important role in the more effective use of science and scientific methods for the benefit of humanity, to contribute to the preservation of peace and the easing of international tensions. It emphasizes the special responsibility of all branches of government and state governments in protecting the rights of scientific workers and creating satisfactory conditions for conducting scientific research.

In this fundamental document, the basic rights and duties of scientific workers are formulated:

• take an active part in determining the ways of development of science and technology and the directions of their application in the interests of humanity, namely: analyze the necessary social conditions in each case and inform the public about possible social consequences, participate both in the preparation and in the implementation of the adopted decisions, control and analysis of their results;

• conduct scientific research and training as part of their professional activity; to intervene and take the initiative in consciously choosing the subject and methods of research, in providing access to sources of information necessary for the performance of one's duties; identify, analyze and fully understand the risk associated with conducting scientific research;

• communicate and exchange information obtained both during own research and from external sources; promote cooperation and healthy competition between

scientists, the dissemination of knowledge with a humane purpose; use modern means of communication in order to ensure access to scientific information and stimulate discussions both in the scientific community and in society as a whole, to promote constructive dialogue with people whose responsibility lies in other spheres (media, politics, economy, etc.), which will facilitate society recognition of moral values, scientific and technical achievements;

• to create, apply and disseminate knowledge is a direct duty of scientific workers to future generations both individually and collectively through contacts and cooperation;

• play their role based on their own scientific activity. This means: trust in the work process and recognition of achievements in scientific and social activities for all scientific workers, especially young scientists and women; the opportunity for scientific workers, men and women, to pursue their scientific careers independently of family and parental responsibilities and to create equal conditions and opportunities for their professional growth; rewards according to qualifications and work results;

• to change the social environment of people and the natural environment, considering human development and protection of the natural environment as determining criteria when choosing the means of using scientific knowledge.

Rights and obligations of a scientific workermust be clearly defined by legislative documents and by concluding a collective labor agreement between employers and trade union organizations of scientific workers. Scientific workers must be able to democratically determine working conditions and the style of cooperation adopted in scientific organizations.

Career advancement should be based on factors such as knowledge, skills, experience, productivity and efficiency. The development of science should be completely based on democratic methods that ensure the creation of hierarchical structures, organizations and scientific institutions. The rights of scientists to benefit from their original ideas, discoveries and inventions, as well as profit from their implementation, must be protected by law and contracts.

Scientific honesty

Scientific honesty determines the ethical values that should guide scientific workers. Thanks to scientific research, humanity learns more about the world, discovers new truths, and corrects misconceptions and concepts. Thanks to the educational process and free scientific discussions, scientists try to support and promote the desire to learn and transfer knowledge. Since the pursuit of knowledge and the search for truth are of vital importance for scientific and scientific-pedagogical activity, deliberate dishonesty is extremely dangerous for human development. Even when dishonesty does not cause significant financial losses, it

undermines the value of the research performed and creates a negative image of scientists among citizens.

The rules and regulations on honesty in scientific research and scientific creativity are valid for all scientific workers involved in scientific and scientific-pedagogical activities. They are contained in the following basic definitions.

Copyright: only those scientific workers who have made a significant intellectual contribution to a certain scientific work are recognized as authors.

Violations in scientific research are considered to be: falsification; recycling and plagiarism; non-recognition of authorship or significant intellectual contribution to scientific work; using new information, ideas or data from confidential manuscripts or private conversations; use of archival materials in violation of the rules for the use of archival documents; non-compliance with state legislation, statutes and collective agreements of academies, institutions of higher education and research organizations, regulations on the safety of scientific work/

Factors inherent in research processes and unfalsified (unconscious) research errors, conflict of data, different interpretations and different interpretations of obtained results, experimental developments are not considered violations in scientific activity.

Each scientific worker has the right to the product - the result of his own intellectual work, but he should not limit access to the results of those who helped him in carrying out the research. A researcher should be open to criticism, advice and wishes. It is necessary that the scientific team properly treat information that is considered confidential. But confidentiality norms should not prevent the dissemination of such information as the objectivity of payment for scientific work in the team.

Conflict of interest

Conflict of interestis a situation in which the judgments, conclusions and actions of an individual are influenced by numerous conflicting interests that are opposite in form and content. In such situations, it is necessary to find ways to maintain a balance between personal autonomy (independence), professional integrity and accountability.

The types of conflicts of interest can be different(Fig. 1):

Conflict of interest due to personal relationships. In the event that decision-makers have personal relationships with those affected by these decisions (family members, relatives, friends), in order to ensure objectivity and limit the influence of personal relationships (both positive and negative interests) it is necessary to avoid their participation in making these decisions.

In addition, practice shows that one should not participate in decision-making (except in cases of extreme importance) concerning scientific partners - past or present. Such decisions should also be avoided (without openly explaining the reasons for the motives), if participation in their adoption may negatively affect their objectivity.

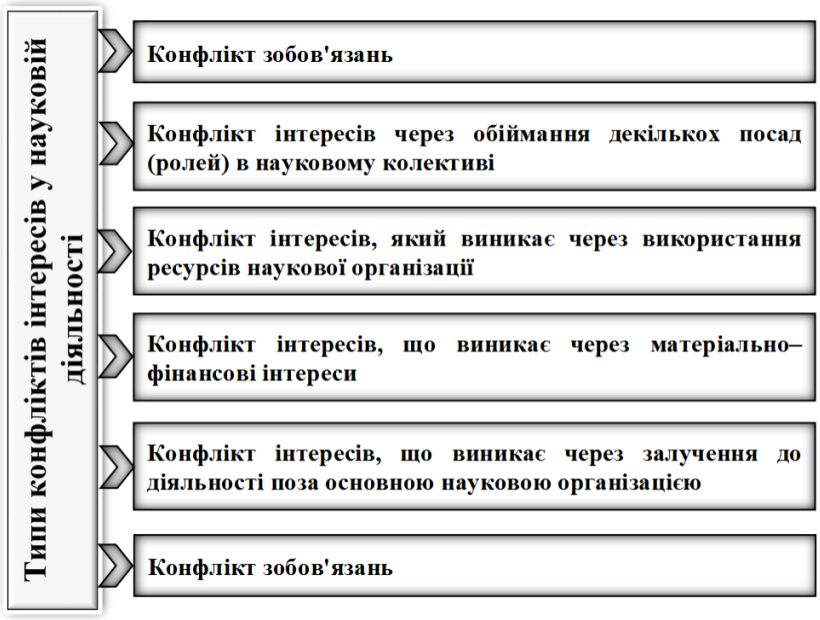

Fig. 1 – Types of conflicts of interest in scientific activity

Conflict of interests due to holding several positions (roles) in the scientific team. Such conflicts of interest (real, potential, and perceived) can be resolved by avoiding decisions that could interfere with balanced, objective judgments and conclusions. Professional conflicts can also be avoided by drawing collegial attention to possible bias and bias.

A conflict of interest arising from the use of resources of a scientific organization. A research institute or institution of higher education has various resources (computers, equipment, materials, means of communication, etc.). In the case when the goals and objectives of a scientific organization and an individual team member coincide (for example, a scientific publication, an analytical note, etc.), the organization's resources can be used.

If the members of the organization use its resources for purposes other than their main professional activity (for example, performing works to order, under a personal grant), the scientific organization has the right to demand payment for the use of resources. The amount and order of payment is determined separately for each case.

If it is necessary to use the name of a scientific organization or institution of higher education in the work (publication, report, etc.), one should contact the collegial board (scientific or scientific and technical council) for a recommendation, regardless of the purpose of using the name or position (role) in the scientific

organization.

Conflict of interests arising from material and financial interests. Members of the scientific team, using the right of intellectual property, have the right to enter into agreements and freely sell their works created within the framework of their scientific activity, without causing a conflict of interests. The products of labor can be articles, brochures, monographs, films, books, works of art, inventions, etc. It is desirable to write such a provision in the collective agreement of the organization.

Researchers can work part-time in other similar organizations, create various types of organizations (profit and non-profit firms, public organizations) that can provide consulting services, carry out commissioned research, produce and sell goods and services. In this case, the main thing is that such activity does not interfere with the fulfillment of duties to the scientific organization, where scientists are constantly working.

A conflict of interest may also arise when academic staff or management have a personal material interest in organizations and firms with which their academic organization enters into business agreements or conducts joint business. In this case, some members of the scientific organization may receive unfair advantages and benefits. Therefore, observing scientific ethics, one should avoid concluding agreements with firms and organizations in which members of the scientific team have a significant material and financial interest.

It is also necessary to avoid situations in which members of the scientific team or its leaders will negotiate and conclude agreements with themselves, as with employees of other agencies or firms. Otherwise, this has one name - corruption.

Conflict of interest arising from involvement in activities outside the main scientific organization. Recently, scientific teams and their individual scientific workers are increasingly cooperating and have business relations with various state institutions and private businesses, with state and private scientific foundations, both Ukrainian and foreign, which support their research and use knowledge and experience. Such cooperation is socially and economically beneficial and profitable.

Each scientific organization must develop for itself models of external cooperation that would not affect the quality of its research and creative activities. Such connections will facilitate the exchange of ideas. But trends in overemployment outside the primary workplace should be limited by time frames in collective bargaining agreements.

Conflict of obligationsis a special form of conflict of interests that arises in relation to the ratio of time spent and duties and obligations in a scientific organization.

A real conflict of obligations arises when activities outside the scientific organization overlap with the fulfillment of obligations at the main place of work. To

avoid a conflict of obligations, it is necessary to either reduce the volume of other activities, or to review and reduce the volume of work in a scientific institution.

A researcher has the right to other obligations and to carry out other activities, if they do not prevent the full fulfillment of personal or collective obligations to the scientific organization where he is permanently employed.

Compliance with ethical norms and standards. Submission of official complaints

In case of violation of ethical norms, it is necessary to carefully understand the situation and be guided by the legislative norms of scientific work, collective agreements, ethical norms recognized in scientific collectives. The resolution of ethical conflicts arising in the form of dilemmas should be entrusted to commissions on labor disputes at trade union committees of academic institutions, through discussion and debate. At the same time, it is better to observe the principle of confidentiality in case of consideration of questionable behavior or violation.

Anonymous testimony and statements should not be considered unless people and property are in real danger. When mandatory principles and standards of conduct (scientific, research, financial) are violated, then they should become the subject of official hearings.

An official complaint must be submitted in writing to the commission on labor disputes or to the management of a scientific or educational institution. If necessary, after discussion in the commission, such complaints can be publicly considered by the labor team. If, at public hearings, a member of the scientific team is found guilty of dubious actions deemed serious, he may be subject to sanctions proportional to the seriousness of the violation.

Basic principles and norms of the ethics of science

Studying science- a specific type of human activity, the essence of which is a systematic research process aimed at obtaining knowledge based on verified results.

Ethics of scienceis a branch that studies the specifics of moral regulation in the scientific field, as well as the synthesis of values, norms and rules in this field. It encompasses two sets of problems: the first is related to the regulation of relations within the scientific community itself, and the second is between society as a whole and science.

The main ethical principles of scientific activity, which are recognized by the majority of scientists, are as follows:

a) self-worth of truth;

b) novelty of scientific knowledge; c) freedom of scientific creativity;

d) openness of scientific results;

e) organized skepticism.

The principle of self-worth of truth

The principle of self-worth of truth or universalism implies the orientation of

the researcher and scientific activity to the search for objective knowledge, and not to personal, group, corporate or national interests. The truth and only the truth is the main value of activities in the field of science.

Only one dichotomy has meaning: "true - false", everything else is beyond the boundaries of science. No matter how new or trivial, "expected" or "inconvenient" the truth obtained in the process of scientific research turns out to be, it must be made public.

In science (at least in the field of exact sciences), the principle of freedom of conscience is not applied, so everyone can believe in their own way: science lives by knowledge, not by faith. One of the mandatory conditions of scientific activity follows from this principle: exact compliance with the rules of obtaining, selecting, processing, and publishing data in a specific scientific discipline.

The novelty of scientific knowledge

Science exists only by developing, and it develops through the continuous increase and renewal of knowledge. The need to obtain new facts and create new hypotheses requires the researcher to be informed about the previously acquired knowledge in this field of science.

Freedom of scientific creativity

Freedom of scientific creativity- an ideal principle, which, unfortunately, is not always realized in scientific activity. There are no and should not be prohibited topics for science, the definition of the subject of research is the prerogative of the scientist himself. Any result that claims to be a scientific achievement must be carefully analyzed and evaluated by the scientific community, regardless of the scientist's past merits. In real situations, the effectiveness of this principle is mostly limited by both internal factors operating in the scientific environment and external factors - ethical, social and material.

Openness of scientific research

There is no intellectual property right to the results of fundamental scientific research (not to be confused with inventions), because they belong to all of humanity. The author, and no one else, may prohibit the use of scientific results or claim any compensation for their use, other than attribution. Accordingly, any scientist who has obtained new results must publish them, since new knowledge becomes an integral element of the scientific picture of the world only when it is verified and recognized by the scientific community.

Organized skepticism

A principle that involves openness to doubt about any results of scientific activity, both one's own and those published by other scientists. This rule requires understanding the implicit assumptions accepted as axioms; a vigilant attitude to attempts to accept wishful thinking, caused by personal interest or reasons of an

ethical nature; careful attitude to the possibility of misinterpretation of the results.

Scientific honesty and adherence to the principles of scientific ethics are very important for scientific activity, the purpose of which is to expand the boundaries of our knowledge and win public recognition. The principles of scientific ethics can be violated in a variety of ways, from careless application of scientific methods or careless documentation of data to serious scientific crimes such as intentional falsification or deception.

Such violations contradict the essence of science as such - a systematic process of research aimed at obtaining knowledge based on verified results. In addition, they undermine the public's faith in the reliability of scientific results and destroy the mutual trust of scientists, which is the most important condition for scientific work in these days, when cooperation and division of labor have become the norm.

Although a single set of rules is not sufficient to completely prevent dishonesty in science, appropriate measures can nevertheless ensure that all those engaged in scientific activity are regularly informed about the norms of scientific ethics. This is a significant contribution to reducing the number of cases of its violation.

Basic norms of scientific ethics

The following basic norms of scientific ethics are distinguished, which must be followed as such, which are common during the conduct of scientific research.

The norms governing everyday scientific activity include:

- exact compliance with the rules of data collection and selection, which are valid in a specific scientific discipline;

– reliable organization of primary data protection and storage. Clear and complete documentation of all important results;

- comprehension of implicit, axiomatic assumptions. Vigilant attitude towards attempts to accept wishful thinking, caused by personal interest or even reasons of an ethical nature. Careful attitude to the possibility of misinterpretation due to methodically limited opportunities to establish the object of research.

Norms regulating relations between colleagues and employees:

- an obligation not to interfere with the scientific work of competitors, by, for example, delaying feedback or transferring to a third party the scientific results obtained under the condition of confidentiality;
- active promotion of scientific growth of young scientists;
- openness to criticism and doubts expressed by other scientists and work colleagues;

– careful, objective and unbiased assessment of the work of colleagues; unbiased attitude towards them.

The rules governing the publication of results include:

– mandatory publication of the results of the work carried out at the expense of state funds (principle of general availability of the results of fundamental research);

– appropriate submission of unproven hypotheses and recognition of errors (principle of scientific culture that allows for the possibility of error in science);
- honest recognition of merit and proper assessment of the contribution of predecessors, competitors and colleagues (principle of recognition of merit).

Practical use of ethical principles in students' scientific activities.

The ethics of scientific activity are the rules of conduct that must be strictly followed by all scientists, in particular, young researchers and students.

The ethical principle "interaction with the scientific supervisor" The ethical principle of "interaction with a scientific supervisor" provides for:
– the student must be thoroughly familiar with the monographs and other significant publications of his supervisor;
– know memorable dates, positions, regalia, achievements of your manager;
– to trust the intuition of your manager, try to understand his logic of thinking;
- value his time, workload and health;
- you should coordinate your research plans and report to your supervisor in a timely manner;
- inform the manager about your difficulties, but do not whine about obstacles;
– submit your manuscripts in printed or electronic form only after carefully proofreading the text;
- to record the opinions and remarks of the scientific supervisor, to ask for permission to make recordings on a voice recorder.

There are the following basic recommendations for interpersonal relations with a scientific supervisor:

1. A scientific supervisor is a scientist who agreed to hard intellectual work: to direct the course of student scientific research, analyze, proofread and correct the text of the work. For this agreement, he deserves respect and honor.

2. A scientific supervisor is a specialist in a certain scientific topic, who usually strives for his followers to continue his work in this direction. Studying and using the achievements of a scientific supervisor is a natural condition for successful professional interaction with him.

3. Criticism of scientific work should not be equated with criticism of the student's personality. Remarks and their correction are a necessary component of the process of transforming scientific work from an imperfect state to relative perfection.

4. Completion of work on a scientific thesis is not usually considered by the supervisor as the end of the relationship. That is why he can perceive the lack of contact as ignoring, as the fact that the student did not pass the humanity test, etc.

There are also certain recommendations for a scientific supervisor regarding his interpersonal relations with a student-young scientist:

1. A student is a potential scientist who strives not to stop in his professional

growth, dreams that his scientific results will be useful for people. Such a personal position deserves respect.

2. The opinions and views of the supervisor may not coincide with those of the student. A student can understand the logic that is obvious to a scientific supervisor only over time, having carried out his own scientific research, realizing the value of mistakes and discoveries. Therefore, a wise manager will take into account the time factor and give the student the opportunity to gain experience on his own.

3. The novelty, originality of the student's contribution to the solution of a certain scientific problem may not be embodied in standard schemes of scientific and experimental activity for a certain period of time. At this stage, it is important not to unify creative ideas too much, which can lead to the fading of the student's initiative, but to help him find the "golden mean" between the original content and an acceptable form of presentation of scientific material.

4. Publication or protection of obtained scientific results is a multidimensional process, the success of which consists of several components, namely:
having a completed scientific work;
personal competence of the student in the medical field;
the ability to present and defend the results of one's research before the scientific community.

The preparation of the student requires the coordination of these components.

5. The lack of a scientific connection with the supervisor after the end of the scientific cooperation does not mean ungratefulness, because the student can carry the good lessons learned further in life, helping others, carrying out further scientific research, multiplying the truth in a unified world.

Ethical principle "interaction with partners"

The ethical principle "interaction with partners" means that:
– the student must always have up-to-date coordinates (business card) for exchanging contact information;
- when a student is interested in other people's publications, he should be ready to offer his own in exchange for them;
- the student should not keep the books taken from the library - others may expect them;
- the student should treat the books in such a way that others can read them after him;
- in scientific disputes, the student must remember the limitations and subjectivity of his knowledge;
- a real scientist, including a student, always respects people's right to an opinion different from his own, refrains from unequivocal criticism, does not use harsh words.

Adhering to the ethical principle of "interaction with colleagues":

– remember about copyright: unless otherwise agreed, by default, co-authorship is considered equal to all authors of a scientific work;

- in teamwork, everyone can be a leader in their nomination, have their own role.

Violation of ethical principles in scientific activity leads to plagiarism.

Plagiarism and means of its search.Text analysis for plagiarism.

Plagiarism is the borrowing of someone else's text without reference to its author. In fact, this is the appropriation of other people's ideas, the theft of intellectual property. According to the norms of Section 5 of Article 5 of the Law of Ukraine "On Copyright and Related Rights" dated July 11, 2001. No. 2627–3, plagiarism is the publication (publication) of someone else's work in whole or in part under the name of a person who is not the author.

In fact, the concept of "plagiarism" in scientific research is rather difficult to give an exact and complete definition, because it includes a wide range of actions, starting with the use of incorrect quotations and ending with the theft of other people's works and ideas.

The main causes of plagiarism in student scientific research are as follows: lack of information search skills. Many students do not know how to use library catalogs, find articles in library databases, or use other reference sources. Institutions of higher education can help their students acquire such skills by working in partnership with their libraries. Yes, most higher education institutions offer free training seminars, courses, lectures "Orientation in the library". At such classes, students familiarize themselves with the library, learn to work with library catalogs and databases;

problems of evaluation of Internet sources. Many students do not know how to critically evaluate Internet sources, and this can affect the process of searching for information and the quality of scientific work. It is important to remember that on the Internet in most cases there is no control over the quality of the material. Good sources for students are reference books of library literature on the Internet; confusing plagiarism and paraphrasing. According to the research, 60% of students cannot distinguish between simple paraphrasing of the text and plagiarism. The problem becomes even more serious when students need to paraphrase a text with unfamiliar words and technical terms. A study published in "Psychological Reports" states that "when students need to paraphrase a complex text for which they simply do not have enough knowledge, they may even unintentionally engage in plagiarism." Failure to distinguish between plagiarized text and paraphrased text, as well as incorrect citation sources, are often causes of unintentional plagiarism.

Confusion with terminology. Terminologyis a problem that confuses students and causes them confusion and anxiety. Many of them do not understand the difference between a report and an abstract, an exposition and an argument, a topic

and a thesis. And the terms "analysis" and "discussion" should generally begin the list of terms of all times and peoples. Instructions for scientific work and tasks set by the scientific supervisor should be concise, clear and easy for the student to understand;

sloppy note-taking – some people inadvertently plagiarize while doing previous research work. At the note-taking stage, paraphrased material and quotations are very easy to confuse if done carelessly. Later, when students begin to write an essay, they cannot distinguish which material is their own and which is a quote from other sources. In addition, by recording incomplete or incorrect bibliographic information, the student will not be able to later find the source from which the quote was taken to ensure that he does not resort to plagiarism.

To avoid this problem, some authors annotate only direct quotations. This makes it possible to understand what needs to be paraphrased and when to quote.
Other methods of distinguishing between direct quotation and paraphrasing are to put the letter "P" next to the paraphrased material, as well as to indicate the page after each note, or to write everything in quotation marks, even individual expressions that have been rewritten word for word.

In addition, it is very difficult to refer to Internet sources. First, because there are still no uniform rules for this. Second, Internet addresses change. It can also be the case that a website changes its address literally overnight. Or these addresses can be too long, complex and confusing.

One of the main requirements for scientific articles is their originality. However, authors often use the work of other authors to write scientific papers.

This is natural, because civilization develops in the direction of creating new knowledge on the basis of already accumulated information. Creators demonstrate what is already known so that their contribution to the work is understood. This is due to the use of quotes. Copyright and cultural customs require authors to be named, cited, and sourced. However, sometimes it is difficult to determine whose novelty is in the created text, whether it is a reprint of already published works or their parts. In other words, are there signs of plagiarism in the new scientific work?

Plagiarism detection tools

To answer this question, you can use services for searching for copies of texts on Internet sites. Here are some of them:

1. ISTIO (istio.com/rus/text/analyz/). Provides analysis of the text of a scientific work and search for plagiarism. This online service is designed to detect copies of texts or their parts on the Internet, and it can be used for Russian-language and English-language texts. It also allows users to define text size, text map, frequency of use of individual words and some other technical and literary parameters of articles. The peculiarity of the service is that it only gives links to sites, but does not indicate in which part of the text a match is found.

2. Advego Plagiatus (advego.ru/plagiatus/) is a program for searching the Internet for plagiarism, identifying full or partial copies of a text document. The program has an intuitive interface, determines the level of uniqueness of the text, indicates its sources and the proportion of its coincidence. This service can be used for Ukrainian-language texts.

3. Anti-Plagiarism (antiplagiat.ru/QuickCheck.aspx) is an online service with a maximum text download volume of no more than 3,000 characters. It is a standard tool used to search for borrowings when checking students' works. The originality of works is checked against the service's own database, which includes more than 10 million works by various authors and directions.

4. The Tyrnitip database (tumitin.com) is an English-language anti-plagiarism product that allows you to analyze texts and detect unauthorized copying of fragments from other sources. The database allows you to check student works, diplomas, dissertations and other scientific works, thus preventing copyright infringement. The entire process takes place online, without the use of paper. This is a comprehensive solution for managing the writing of student and scientific papers from the beginning of their creation.

5. The Miratools database (miratools.ru) is generally the same as the previous ones, but it provides an opportunity to check Ukrainian-language texts.

There are about a dozen programs that check text for plagiarism freely available on the Internet. However, most of them work only with English-language texts.

In addition, you can check the text for plagiarism without using the specified services, but using search engines. To do this, it is necessary to enclose a part of the text (no more than 100 characters) that is being checked in quotation marks and insert it into the Google, Yandex or Rambler search bar.

Materials for self-control:

AND. Questions for self-control:

1. What is a scientist's code of ethics?
2. What are the ethics of a scientist?
3 Around which main fundamental values are the norms of science built?
4 What is the main task of the scientist's code of ethics?
5 What is the essence of the concept of ethics of scientific activity?
6 What are the main components of the ethics of scientific activity?
7 What is scientific integrity?
8 What is the essence of the conflict of interests?
9 What are the types of conflicts of interest in scientific activity?
10 Name the main ethical principles of scientific activity.

11 What is plagiarism and what are the means of its search?

B. Test tasks and tasks

Summing up.

List of recommended literature

Main:

1. Gutorov O.I. Methodology and organization of scientific research: study guide. Kharkiv: KHNAU, 2017. 272 p.
2. Danilyan O.G., Dzoban O.P. Organization and methodology of scientific research: teaching. manual Kharkiv: Pravo, 2017. 448 p.
3. Degtyarev A.V., Kokodiy M.G., Maslov V.O. Fundamentals of scientific research: a study guide. Kharkiv: KHNU named after V. N. Karazina, 2016. 78 p.
4. Kostyukevich V.M., Konnova M.V. Methodology of scientific research: study guide. Vinnitsa. 2017. Vol. 172.
5. Malyhina V.D. Methodology of scientific research. Rivne. 2016. 247 p.
6. Methodology of scientific research: teaching manual. / V.I. Zatserkovnyi, I.V. Tishaev, V.K. Demidov – Nizhyn: NSU named after M. Gogol, 2017. – 236 p.
7. Methodology of scientific research in medicine: teaching. manual / V.D. Babajan, N.S. Bakumenko, O.I. Kadykova and others; under the editorship P.G. Kravchuna, V.D. Babajana, V.V. Meat eater. – Kharkiv: KhNMU, 2020. – 260 p.

Additional:

1. Adamenko M. I., Beilin M. V. Fundamentals of scientific research. Kh.: KhNU named after V. N. Karazin, 2014. 188 p.
2. Bobylev V.P., Ivanov I.I., Proydak Yu.S. Methodology and organization of scientific research: study guide. Dnipropetrovsk: System Technologies, 2008. 264 p.
3. Kislyi V. M. Organization of scientific research: study guide. Sumy: University book, 2011. 224 p.

Electronic information resources:

1. Best Evidence. URL: http://www.bestevidence.com/
2. BritishMedicalJournal. url http://www.bmj.com/specialties/evidence-based-practice
3. CanadianMedicalAssociation. URL: http://www.cma.ca/
4. Center for Evidence-based Medicine at the University of Oxford. URL: http://www.cebm.net/
5. Clinical Evidence. URL: http://clinicalevidence.bmj.com/x/index.html
6. Cochrane Collaboration open learning material for reviewers. URL: http://www.cochrane-net.org/openlearning
7. Cochrane Library. URL: http://www.thecochranelibrary.com/
8. Current Controlled Trials. URL: http://www.controlled-trials.com/mrct
9. eGuidelines. URL: http://www.eguidelines.co.uk/

10. Evidence-Based Medicine. URL: http://ebm.bmj.com/
11. Canada Clinical Guidelines Database. URL: http://www.phac-aspc.gc.ca/
12. JAMAEvidence. URL: http://www.jamaevidence.com/
13. Medscape. URL: http://www.medscape.com/
14. National Institutee for Clinical Excellence. URL: http://www.nice.org.uk/
15. PRODIGY (Clinical Guidance). URL: http://prodigy.clarity.co.uk/

Practical lesson No. 15

SUBJECT: "Development of innovative projects" - 2 hours

Goal:acquaintance of students with the stages of development of innovative projects.

Basic concepts:

Term	Definition
Innovation	— an idea, the newest product in the field of engineering, technology, labor organization, management, as well as in other areas of scientific and social activity, based on the use of scientific achievements and best experience, is the final result of innovative activity. Innovation is the result of systemic activity aimed at realizing the achievements of scientific and technical progress and their improvements, which contributes to quantitative and qualitative changes in the internal environment of the enterprise and ensures increased efficiency and obtaining competitive advantages.
Innovative activity	— a type of activity related to the transformation of scientific research and development, other scientific and technological achievements into a new or improved product introduced to the market, into an updated or improved technological process used in practical activity, or a new approach to the implementation of social services, their adaptation to the current requirements of society.
Innovative strategy	— one of the means of achieving the company's goals, which is new for this company, for the market, for consumers, etc. The innovation strategy is developed so that it is flexible and in case of market changes it is able to quickly transform into another.

Actuality of theme

Investment activity and the introduction of innovations in all spheres of management and implementation of medical services are of great importance in terms of reforming the health care system. The importance of the mentioned aspects of state management of the health care system is that they will allow to modernize the mentioned system and improve the quality of medical services and as a result increase the level of public health. "Transformation processes are reflected in the entire structure of the country's economy, including the social sphere, and lead to frequent changes in the conditions of functioning in health care. Changes in health care in the conditions of reform are accompanied by ambiguous trends, medical and demographic challenges in the conditions of an annual reduction of the working population, a decrease in the birth rate require strengthening of state measures on the effectiveness of medical care of the population with the aim of preserving human potential, increasing the effectiveness of health care activities on at all levels of management, including as a result of innovative changes and their management."

"The basis for increasing the medical, social and economic efficiency of the health care system is the rational introduction of innovative technologies for the treatment, diagnosis, prevention and rehabilitation of diseases, improvement of management and professional training of medical staff of health care institutions. Innovative approaches play a decisive role in the progressive development of any sector of the economy, including the healthcare sector." Accordingly, the issue of studying the state's investment and innovation activity is being updated.

Plan

I. Organizational moment (greetings, checking those present, announcing the topic, the purpose of the lesson, motivating students to study the topic).
II. Control of basic knowledge: Theoretical questions for the lesson:

III. Formation of professional skills and abilities. Practical works (tasks) performed in class:

- Organization of innovative activities;
- Sequence of actions in the development of innovative projects;
- Business plan of an innovative project.

Topic content:

Planning is one of the main elements of the innovation activity management system. Planning consists in the development of the main areas of innovative activity in accordance with the intended development strategy, resource opportunities and the existing market demand. This is a system of calculations, determining the size of investments and preparing decisions necessary to achieve the intended goals. Planning is based on conducting systematic studies of the state of the market, collecting and analyzing numerous data covering economic, political, demographic and other aspects.

Innovation planning is part of the complex structure of integrated planning, which consists of plans of different levels, goals, and content. It is carried out according to goals (strategic or operational), subject (production, sales, finance, personnel), levels (organization, division, program, individual performer), content (technical and economic, product, calendar) and periods (short-term, medium-term, long-term).

Innovation planning has the following functions:

- Setting tasks on the basis of information support about goals, resources, terms and conditions of innovation, including for each participant;

- Preparation of rational and economically justified management decisions based on calculations and reasonable forecasts, taking into account favorable and unfavorable trends and conditions;

Coordination of activities of all participants in the process by various forms of management and stimulation; - Determination of the base and time period for objective control of the state of the system and assessment of the progress of the innovation process.

Innovation projects contain concrete setting of tasks and implementation of

innovations in separate directions, products and services.

Innovative project- this is the procedure for determining goals and objectives for the creation or implementation of a separate innovative product. The project includes forms of management of innovative activities, the process of its implementation and a set of documents that substantiates and characterizes these measures.

Management of innovative activities is a system of interrelated actions determined by deadlines, resources, and performers and aimed at achieving specific goals.

The innovation process includes organizational, production, technological, commercial and other measures that lead to the introduction and spread of innovations.

The set of documents contains various types of technical, financial and calculation documentation necessary for the implementation of innovations.

Thus, an innovative project can be defined as a complex of interrelated programs that ensure the effective achievement of a specific innovative goal, agreed on resources, terms, executors and documented.

In order to make a decision on the expediency of implementing innovative projects and the amount of their financing, the projects must undergo an examination procedure. The analysis of innovative projects has its own characteristics. You cannot limit yourself to standard methods, you need to combine qualitative and quantitative methods with comparative analysis of factor models. Therefore, both standard approaches of correlational, financial and investment analyzes are used, as well as situational, probabilistic modeling methods, forecasting results of scientific and research developments, assessment of project viability. This is due to legal, institutional, environmental and social problems, the fundamental novelty of the product, the variability of the market, special training and selection of personnel, significant technical, technological and commercial risks.

Innovative projects are characterized by high uncertainty at all stages of implementation, they are not immune to the appearance of a more promising novelty at any moment. Even projects that have successfully passed the stage of implementation into production may not be accepted by the market, and their production should be discontinued.

Types of projects

Innovative projects are divided into research and venture projects.

Research projectsconnected with new ideas and aimed at solving actual theoretical and practical problems that have socio-cultural, economic and political significance. Such projects have a high degree of risk and uncertainty of the economic effect, so they are mostly financed by funds from the state budget.

Venture projectsrelated to the development and introduction of a new product or technology, the creation of enterprises and the implementation of other large and expensive developments. Such projects are commercial and are usually financed by businesses and organizations interested in making a profit. Venture projects can be modernizing, innovative, anticipatory and pioneering in nature.

The modernization project ensures the improvement of a service or product

by expanding the range of its properties while preserving the basic technology of its production. An innovative project creates a new product that is significantly different from the old one by adding qualities previously used in other types of goods or products. An anticipatory project involves solving a problem through the use of technical solutions that have not been used anywhere before. When implementing a pioneering project, materials that have never existed before are used , designs, technologies

3. Stages of development of innovative projects.

The starting point is the emergence of a new idea. The formation of an innovative idea and setting the goal of the project are carried out in parallel with marketing research. At this stage, the economic feasibility of introducing a new product, the degree of its commercial value, is analyzed; possible consumers, economic and social consequences of project implementation are studied.

Then the parameters of the final goal of the innovative project are established, on the basis of which the scope and sequence of actions are formed. The final goal is structured, that is, broken down into separate elements. As a result, a hierarchical sequence of goal achievement, the so-called "goal tree", is created. Limiting parameters are calculated (set) for each target element, which must be met during the implementation of the project. The construction of the "objective tree" at the next stage is transformed into a similarly structured system of tasks and activities, the so-called "work tree". If the "objective tree" establishes the necessary means of achieving the project's goals, then the "work tree" determines the ways and means of obtaining these funds.

When building "work trees", the capabilities of the existing organization of production, traditional equipment and technology are taken into account; use of already completed research and development projects; if necessary, plan new research or acquisition of licenses, patents and other innovations created by other organizations.

Since the implementation of innovative projects is associated with risk and uncertainty, it is necessary to consider various options for the implementation of the project. For each of them, measures are being developed to ensure the achievement of the set target parameters within the established terms. The most optimal option is selected after comparing the calculated efficiency indicators of all available options, taking into account the probability of their implementation.

During the implementation of the project, under the influence of external and internal factors, it may become necessary to change the estimated planning parameters of the project. The decision on this is made on the basis of the control over the implementation of the project. The control carried out (at predetermined points of the project, at regular intervals or after an expert assessment of the degree of work completion and project readiness) allows you to compare the achieved results with the planned ones, identify deviations, predict the consequences of the situation and take corrective actions.

The management of innovative projects differs from the management of ordinary investment projects only in that it requires a more in-depth assessment of risks and the choice of ways to reduce them, as well as the possible inclusion of the

stage of venture financing.

In order to make an informed decision, to determine the amount of necessary investments, an economic justification is necessary - a business plan. It describes the main aspects of the future innovation program, analyzes all the problems that can be faced, as well as possible ways to solve them. The business plan allows you to evaluate and justify the implementation of the project in conditions of competition. The content of the business plan depends on the nature of the project - whether it concerns to the service sector or to the production sector, as well as from the scale, but in any case it should give a complete picture of the project.

Risks in innovative activity

As already mentioned, innovative activity is inevitably associated with risk. Its summarizing indicator is the financial risk of the entrepreneur and investors, which characterizes possible losses in case of unsuccessful completion of the financed project, regardless of the reason. The risk in innovative activity increases with the localization of the innovative project. If there are many such projects and they are scattered in different directions, then the risk is minimized.

The main risk- this is the uncertainty associated with decision-making, the implementation of which occurs only with the passage of time. Therefore, the probabilistic character of the expected result is taken into account when developing innovative projects.

The main risks associated with innovative projects can be divided into the following types:

-Economic related to project financing and costing, adoption and implementation of economic decisions;

- Originality, due to the possibility that the offered technologies and products are not in demand by production and the market;

- Technological inadequacy arising from the fundamental difference between technology as a product of intellectual activity and technology as an investment object;

-Financial inconsistency, when the funds allocated for the implementation of the innovative project do not correspond to its content;

- Unmanageability of the project, which arises due to insufficient development of the project, unprofessionalism of the management team;

Legal, related to the observance of normative acts on the protection of intellectual property, obligations in the performance of contracts, determination of development rights.

There are also risks associated with the promotion of a new type of product or service to the market, the competition of ideas and developments, and others that are poorly predicted.

For the field of tourism, the risk of an innovative product not being in demand on the market is the most characteristic - the probability of losses due to the consumer's rejection of the offered product, the lack of a guaranteed market niche for the sale of the product; commercial risk associated with the danger of being overtaken by competitors; risks caused by natural disasters and various conflicts, changes in the economic and political situation. Moreover, these risks can be

superimposed on each other.

In order to reduce the negative impact of risks on the implementation of innovative projects, they should be managed: they should be assessed and identified in a timely manner, and influence and control measures should be taken.

The following options are possible: evasion - the investor and the executor of the innovative project are ready to bear large costs for the implementation of various insurance measures; conscious risk - willingness to bear responsibility for its consequences; indifference - the desire to optimize mitigation costs and the balanced use of various tools and methods of insurance against consequences.

4. The role and nature of investments in innovation processes.

The innovation process is impossible without investment activities, which include: marketing research; investing funds in order to preserve and increase capital; design, construction, start-up or purchase of a finished object (in the case of financial investments, absent); profit.

The purpose of investments is to obtain profit from the invested funds, and the purpose of innovations is to improve the object of investment.

They act as the main sources of investment in innovation:

- Own funds of enterprises, organizations and associations;
- Allocation from budgets of all levels and from extrabudgetary funds;
- Loan funds of organizations, institutions and private individuals on the financial market;
- Foreign investments.

The main sources of own funds are depreciation deductions, profit, accumulated capital.

Depreciation deductions. They occupy a leading place in the structure of the company's own funds, the tendency of their share to grow, especially in conditions of accelerated depreciation, can be traced.

*Profit.*Usually, a large part of the profit that remains at the disposal of the enterprise goes to consumption and only 35 - 45% goes to accumulation.

*Accumulated capital.*Joint-stock enterprises have great potential opportunities to attract investment resources through the additional issue of shares.

The solution of large-scale scientific and technical problems is provided by financing targeted, complex programs, forming funds from the funds of budgets of all levels. Loan funds are often used to finance innovations, the sources of which are bank and commercial loans, leasing.

Venture financing differs fundamentally from budget financing and bank lending in that the capital is invested for a promising idea without guaranteed provision of existing property, savings or other assets of the entrepreneur. The guarantee is the acquisition of rights to all innovations, both patented and non-patented (know-how) and, in case of success, participation in the profits of venture companies.

1. Organization of innovative activities

Innovation is the highway that ensures constant growth and prosperity of the company. Peter Drucker in the book "The Practice of Management" notes: "The goal of any enterprise is customer satisfaction, any enterprise has two (and only these two)

main functions: marketing and innovation."

Marketing is a unique business function. An enterprise can exist only in such an economic environment in which changes are natural and desirable. The second function is innovation. Innovation can be the search and implementation of new applications for familiar products, methods of ensuring sales or management, innovations in the training of managers, provision of better and cheaper goods and services.

Innovations concern all forms of entrepreneurial activity. It is equally important for industrial enterprises, as well as for a bank, an insurance company or a tourist company and other organizations.

Definition of goals. When determining the goals of innovation, the most difficult thing is to predict the consequences and significance of various innovations. It is certainly desirable to achieve technological leadership, but it is always difficult to determine what is more important: a hundred small but immediately applicable product improvements or one fundamental development that in a few years will fundamentally change the nature of business. Entrepreneurs will answer this question in different ways. In the conditions of fierce competition on the market for consumers, the enterprise must simultaneously work on existing and promising products (services).

In the organizational chart of the enterprise, innovation cannot be considered a separate function from marketing. The innovation process extends to the entire business, to all its functions and activities, including marketing itself. In order to determine innovative goals, firstly, it is necessary to forecast the needs of the market, and secondly, to take into account the circumstances that arise or may arise in connection with technological progress in all areas of business.

Typical innovative goals of the company can be: new products and services; product and production process improvement; introduction of innovations in all types of organizational and management activities.

Innovations implemented in the company can be classified as organizational, which involve the development of the company; technical, caused by the introduction of advanced technologies; food related to product assortment and quality; management, requiring improvement of company management methods; marketing; social, related to utility for the consumer and company employees; economic and financial, aimed at improving the stability of the company.

A conscious focus on innovation is most needed where technological change is least effective. For example, the development and survival of an insurance company depends on the introduction of new forms of insurance, modification of existing ones and constant search for better and cheaper ways to sell insurance policies and settle claims.

Setting innovative goals is necessary for all companies, regardless of their size. It is easier to analyze needs and goals in a small company than in a large one, but this does not mean that there are fewer innovative goals in a small business - it is just easier to set them. One of the advantages of small companies is the comparative simplicity of innovation planning. A small company is quite close to the market and therefore will know more quickly what new products are needed. The employees of

such enterprises are closely watching for any improvements that can be effectively used.

In order to determine the goals of the company, it is necessary to develop an innovation policy. Its main principles include:

- Ensuring an increase in the demand for products and services of regular and potential customers through the development of fundamentally new types or improved goods and services, as well as expanding the scope of sales;
- Continuous development of the innovative potential of the enterprise (constant training and self-research) and creation of conditions necessary for the implementation of innovations;
- A comprehensive approach, when technical, economic, social innovations are closely interconnected and mutually promote each other;
- Mobilization of personnel;
- Economic stimulation of employees;
- Risk accounting (the higher the risk, the higher the potential economic effect from the implementation of the innovation).

Innovationshould be oriented to more fully satisfy the needs of the company's customers in the conditions of constantly changing market conditions. Every manufactured product should be considered as an object of constant changes. However, the decision to introduce an innovation does not always mean the elimination of the old product. Innovation is also generated by the desire to extend the life cycle of the product, improving its characteristics. Such innovation is reduced to the modification or introduction of a new function of an already existing product. When developing a new or improving an existing product (service), the main component elements are its advantages compared to similar products and possible substitute products; target market segment, development and possible changes in sales systems; total costs for development, production and sales.

These elements make it possible to evaluate the commercial prospects of the products under development from different points of view: market (needs for a new product, level of competition, degree of market stability and depth of its segmentation); commercial (technical and ethical characteristics of the new product, price, design, design); sales (state and capabilities of existing sales systems, opening of new promotion channels, advertising, compatibility of the new product with the range of already produced products); production (condition of production equipment, professionalism and qualification level of the company's employees, resources and material support).

Development of innovative potential. Entrepreneurship is inextricably linked with innovation and risk management. The main functions of management (planning, organization, operational management, use of personnel, economic control) should be focused on the development strategy, constant changes within business structures, on adaptation to the environment. In this case, it is possible to ensure the receipt of a stable, optimal amount of entrepreneurial income.

The success of innovative management requires adherence to certain principles. At the initial stage, it is preferable to invest in small, concentrated projects, for the implementation of which independent special units are created. They

ensure the formation and development of the constant innovative orientation of the company's employees, conduct research on competing products and industry trends in their development, regularly inform the company's management about the prospects for the appearance of new products and services on the market, evaluate the commercial prospects of developing a new product in a competitive environment.

The success of innovation largely depends on the time of entering the market with a new product. Even a slight delay compared to a competitor or the lack of a market niche can lead to the fact that the situation for the company becomes difficult.

Striving for continuous improvement, the company carries out periodic innovations that can provide clear competitive advantages, despite the fact that they are often associated with high costs and high risk. Market research won't help much here. Periodic or intermittent innovations do not always contribute to the optimization of the production process, as they relate to its individual stages. Moreover, they can negatively affect the practical results of work not only in the short term, but also in the long term.

Dynamic modeling of business

New technologies, the blurring of boundaries between industries, the globalization of markets and increased competition have a significant impact on the environment in which business operates. These factors led to the emergence of dynamic business modeling (DBM). Its essence lies in the integration of the knowledge of various experts, which allows to deepen the understanding of the dynamics of events taking place in the innovation arena.

Innovation arena- the space described by four parameters of innovation, namely: technologies, applications, markets or consumer groups and organizational (internal and external) structure. In other words, dynamic business modeling facilitates the formation of a general model of the innovation process.

The first stage of dynamic modeling. It includes an analysis of the existing and possible future positioning of the company on the market; analysis of interested parties (forces) hindering or facilitating the transition of the company to the position it is expected to occupy in the future; analysis of business processes.

Analysis of the company's positioning involves determining its capabilities (state of assets, etc.) on the market depending on the dynamics of the external environment. The analysis is carried out in two directions: resources and external positions of the company. Competitive position is especially important. Michael Porter's model of five market factors is often used to define it. According to this model, the company's market position is determined in relation to its competitors, suppliers, consumers, new market participants and substitute products.

These factors depend on a number of other interdependent parameters (the number of buyers, suppliers and substitute products), which, in turn, depend on the market segment, product uniqueness, etc.

The analyzed resources of the company are knowledge, reputation, capital (real estate), financial and managerial assets. Currently, the most important factor of production is knowledge, if it is used profitably. Knowledge (especially of high technologies) is often considered as a specific component of the company's resources, which under normal conditions cannot be transferred to another structure.

The main organizational assets are structure, system, culture, flexibility. The structure of the company is constantly changing under the influence of the external environment of management and organizational behavior. A dynamic environment requires that the scope effect be used to the maximum. Their expansion becomes an innovative tool that provides a competitive advantage.

Often, success or failure in the development of new types of business is determined by the values and norms operating in the company, which influence the perception and use of opportunities. Entrepreneurial culture is important for the development of new types of business. Sometimes it is necessary to replace personnel, management system and structure. In order for the company to be able to use the acquired knowledge with benefit for this or that product, process or service, flexibility is necessary.

When evaluating new types of business by entrepreneurs who are ready to take an increased risk, the quality of management is often the main parameter. It is the quality of management, the best indicator of which is previous experience, that determines whether financial resources will be provided to support the innovation process.

An important asset of the company is its reputation, popularity and authority of the brand. When companies evaluate their innovation capabilities, they must take into account and analyze all the factors that affect the result.

Stakeholder analysis.Active subjects (individuals and groups of individuals, organizations) that are affected or may be affected by innovation are interested parties. They have a certain interest in the results of the processes that take place during the development of new forms of business. These are consumers, suppliers, competitors, partners, institutional persons, shareholders. They are divided into internal and external stakeholders.

Involvement of both external and internal stakeholders in the process of developing new types of business greatly increases the likelihood of eventual success. However, even here there are reasonable limits. Involvement of a large number of interested persons leads to a significant complication of the process that needs to be managed. Therefore, the optimal balance between the degree of involvement of interested parties and the complexity of the innovation process should be determined.

In this process, interested parties can play both stimulating and inhibiting roles. The government, interested associations (consumer organizations, trade unions, environmentalists, etc.), mass media can hinder changes. Competitors can also slow down the speed of change. An inhibiting role is played by inertial forces in the company itself - retrogrades, conservatives who adhere to former values and norms, knowledge, skills and abilities. Management systems themselves are not susceptible to change.

External stakeholders. These include consumers, suppliers, competitors, and institutional stakeholders.

ConsumersWhen developing a new product or service, it is necessary to research the composition of consumers in detail. If the physical qualities of a product are quite easy to test, then it is much more difficult to assess its emotional value. Both

traditions and fashion play their role here.

Suppliers.Their roles in the innovation process change depending on the branch of the economy. Suppliers provide the company with financial resources that come from shareholders, banks, the government (subsidies, grants, etc.), raw materials and components, means of production, knowledge and ideas that come from institutions, from consumers and consultants, and personnel.

CompetitorsThey may be interested in developing new types of business in general, but may also prevent rivals from succeeding in innovation. In situations of market growth, joint innovation is more beneficial, as market development for one company may not be possible. In many cases, a profitable partnership with competitors is beneficial, especially if the market is under attack by substitute products.

For partners, the company must be predictable and trustworthy, then they will be willing to invest money and knowledge to pay off the overall costs.

Institutional stakeholders. They are government agencies and infrastructure regulators, especially in regulated industries. The more stringent environmental regulations become in a number of industries (chemical, steelmaking, and automotive), the more they stimulate innovation.

Internal stakeholders- these are owners, shareholders, employees of the company.

Shareholders. They affect its share price. Shareholder value is provided in two ways: through dividends and through an increase in the share price.

The value of the company is determined by four components: cash flow, residual value, discount rate, debts. Value factors for cash flows are growth in sales volume, use of profit margin, share of taxes. Residual value acts as a factor in both working capital and fixed capital, and the discount rate depends on the cost of capital. Debts depend on the financial and investment policy of the company.

Employees of the company. Each innovation affects internal processes and requires adaptation of employees and the organization itself.

When considering the influence of interested parties on innovation processes, the interests of society should also be taken into account. Society is not an interested person in the same sense as specific people and organizations - company employees, shareholders, consumers and competitors. But in order for the company to prosper for a long time, it must contribute to the good of the society of which it is a part. Taking into account the interests of society always pays off.

Business process analysis. A business process is a set of directions of organizational activity in which specific initial components are transformed into a product with predetermined indicators that attract the consumer and satisfy his demand.

The second stage of dynamic modeling.

This is an analysis of non-linear mechanisms that determine the general behavior of the business system and affect the unpredictable dynamics of the innovation process.

There are six main classes of nonlinear mechanisms: "loops of mutual reinforcement", "loops of restrictions"; "locking mechanisms"; temporary delays;

selection mechanisms; mechanisms for creating innovations and making corrections to them.

"Loops of mutual reinforcement"appear when two elements of the system affect each other. Strengthening (weakening) the signs of one element, respectively, affects the strengthening (weakening) of another. "Reinforcement loops" lead to the fact that small events contribute to significant results. Favorable "reinforcement loops" usually benefit the company. They arise during the development of products and new technologies, contribute to their joint evolution. One of the characteristic examples is the joint evolution of types of tourism and methods of transportation and means of accommodation.

There are many unfavorable "loops of mutual reinforcement", which are dangerous or negatively affect the work of companies. Sometimes the reputation of a company or a product can suffer because of some minor event because it was hyped up by mass media. Unfavorable "loops" arise when, in pursuit of speed of development, companies offer products or services on the market with a large number of shortcomings.

"Loops of restrictions". It is known that every growth process sooner or later comes to an end, and then "limitation loops" appear. By their nature, these restrictions can be physical (related to features, properties of the product, technology), economic, social, legal or some other.

Innovation is often associated with the elimination of physical or economic constraints. As a result of product modernization, the potential size of the market can move to a higher level, the final value of which depends on the elasticity of the market. Shifting the constraint triggers a chain of events, the end result of which is a change in the market, market shares, and company value.

In addition to technical and economic limits, there are legal (in the field of ecology, safety, health care) restrictions and social assumptions. Legal norms impose restrictions that cannot be removed due to developments in the company itself. Social or psychological problems can hinder innovation. Because of this, the goal set by the company may change, it is forced to change the type of activity, as a result of which completely new innovative directions may emerge.

"Locking mechanisms"related to technologies, investments, organizational structure, personnel training and other factors. Changes in the role of some factor lead to the indirect influence of all others. This can increase costs and block future benefits. Lock-in mechanisms can create consumer loyalty or neutralize competitors' attacks on consumers in which the company has an interest. In order for the consumer not to prefer the products of another company, various mechanisms can be used: the accumulation of incentive points (bonuses for frequent flyers, hotel customers, etc.), special computer programs, videos. "Locking mechanisms" reduce the company's flexibility and innovation.

Temporary delays. They are related to fluctuations in demand. For example, due to high prices for pork meat, all large producers increase the number of reared livestock. As a result, after a certain period of time, the supply of pork begins to exceed demand and prices for it decrease - the market cannot expand, producers suffer losses. Next year, the opposite happens - producers have reduced the number

of pigs, the demand for meat exceeds the supply - prices are rising. The situation repeats itself and takes on a cyclical nature.

There are other cases of temporary delays. Thus, the decision to hire new employees and the temporary delay caused by their training can lead to the same cyclic behavior of the system. Companies that take into account the cyclical nature of time delays can make a profit if they manage to reduce their duration compared to competitors.

Mechanisms of selection. They operate when consumers make decisions about purchasing certain goods or services based on their preferences and perceptions of product characteristics. Selection mechanisms are various forms of testing and interim reports. They reflect the criteria used by consumers, shareholders, and other interested parties when selecting factors that ensure a company's profit. Legal regulations are an important selection mechanism, especially in regulated industries.

Different configurations of processes can lead to the appearance of different nonlinear mechanisms. There are two important aspects of dynamic systems: evolution and self-organization. Evolution is a process that takes place under the influence of three main mechanisms: selection, "closing", creation of innovative systems and corrections to them. From the point of view of self-organization, such nonlinear mechanisms as "loops of mutual reinforcement", "loops of limitations", "closing mechanisms" and time delays play an important role. Knowing and understanding their essence, you can ensure advantages for your company and achieve success.

Analysis of recent research and publications. The investment development of the health care system and the introduction of innovations were outlined in the scientific works of domestic and foreign scientists: O. Amosha, M. Gichiev, D. Henderson, O. Yevseeva, O. Zaglada, A. Kalyuzhny, D. Karamyshev, N. Kryvenko, E. Maguire,

V. Lekhan, O. Mendrik, Z. Mytnyk, H. Mooney, V. Pashkov, I. Rozputenko, V. Rudy, R. Saltman, H. Slabky, I. Solonenko, N. Solonenko, S. Stetsenko, J. Figueiras, V. Chernenko, M. Shevchenko, S. Shorgela, I. Shcherbina, M. Yatrebova and others.

Innovation in medicine."The word "innovation" first appeared in the French language at the beginning of the XIII century and meant "renewal", "change". In the 19th century, the term "innovation" began to be used in ethnography, in natural history, in linguistics, in jurisprudence, which means the emergence of some quality that did not exist before, and the methods of emergence are different: it is both the transfer of what is already known to new conditions, and a gradual change. but something new always appears. Thanks to the Austrian economist J. Schumpeter, the concept of "innovation" entered economic science at the beginning of the 20th century. Emphasizing the decisive role of innovations in the cyclical dynamics of economic development, he defines innovations "as any changes with the purpose

introduction and use of new products, markets and forms of company organization, emphasizing at the same time that innovations are the main source of development of economic systems".

"Innovation in medicine is related to the process of transforming a productive

idea into a practical plane, into something that can be used, implemented or achieved and, if possible, should bear fruit in the form of increasing the efficiency of the health care system, prevention of the most common diseases" .

"In the dynamics of innovation, the imperative of certain genetics can be observed. The productive forces created by previous generations serve new generations as raw material for new production, for the development of productive forces, for the creation of new labor tools. Each innovation relies on the accumulated preliminary work of innovative development, inherits the genotype of the transformed system, transforming it in relation to

to new internal and external conditions, updating outdated elements: at the same time, the most effective innovations are selected from a multitude of possible ones."

The issue of investment and innovation activities of the state in the field of health care is the basis of improving the quality of medical services, improving the health of the population, and ensuring the availability of medical care. Scientists from many countries of the world have repeatedly emphasized this, in particular: Gichiev M.M. in his study indicates the following advantages of innovative modernization in the system

of health care: "innovative modernization of health care will allow the most optimal way to solve the cardinal improvement of health and, as a result, the quality of life of the population, demographic problems and the issue of premature mortality. The innovation process is characterized by a series of events, as a result of which the innovation spreads in practical use to achieve the goals of the institution of protection"

Yevseeva O.O. researched modernization processes in health care. In one of her works, the author notes: "Prospects for the further development of the social sphere are inextricably linked with the modernization processes in health care, designed to ensure the availability of medical care, achieve maximum effectiveness and improve the quality of medical services provided, based on the promising achievements of medical science and their practical implementation in the activities of health care institutions. Creation and use

innovations in the health care system, both in the field of disease prevention and treatment, and in the field of socio-economic development of health care institutions, their organizational and management activities are especially relevant in the direction of the orientation of state policy in the field of health care to a comprehensive approach to the health care of the population, to the expansion of the range of medical services and their fundamentally qualitative improvement in order to increase the life expectancy of citizens, strengthen their health, increase work capacity, and, therefore, improve the quality of work. In this regard, the state is making significant efforts to create a comfortable environment for conducting world-class research in Ukraine, promoting scientific research in the promising areas of both medical science itself and its organization and management. The state implements federal target programs aimed at developing and increasing the efficiency of health care and supporting complex socially oriented innovative projects in the field of health care."

When justifying state-management decisions in the field of investments and innovations, it is necessary to take into account that the state acts as: manager, controller, investor. At the same time, the health care system itself should be considered as a market for medical services, regardless of whether these services are provided by private or communal or state health care institutions. The market of medical services is an exchange of medical services and goods, organized according to the laws of commodity and money circulation in accordance with supply and demand. Demand - the amount of medical services that people want and can buy in a certain period of time at a certain price. Demand characterizes the paying need for medical services. Offer - quantity

medical services that health care workers can provide in a certain period of time at a certain price.

Yastrebova M.V. in the context of innovative management of the health care system, it is proposed to consider the market of medical services in the context of the following properties:

"- the seasonal factor has a significant impact on the dynamics of demand for medical services;

- territorial segmentation of the healthcare services market;

- a relatively high rate of turnover of capital;

- a great influence on the demand and supply of medical services is provided by personal contacts of the producer and consumer, which on the one hand can contribute to an increase in the demand for medical services, and on the other hand, patient dissatisfaction can reduce demand, undermine the image of the health care institution and create difficulties for the market;

- variability of market conditions depending on natural and climatic cataclysms;

- the complex structure of demand for health care services, connected with the need for their personification and individualization;

- specificity of the result of medical activity;

- information asymmetry in the market of medical services

- the lack of medical knowledge makes the patient as a consumer vulnerable to the doctor, and the doctor can dictate the terms of economic relationships;

- the risk of introducing a new product is much higher and dangerous, because with an unfavorable result, the consequences affect the patient's health, and the responsibility of the med. personnel is much higher;

- the service provider's subjective approach to determining the list of medical procedures;

- irrational consumer behavior and others"

In the context of reforming the health care system, the investment and innovation activity of the state has

take place as follows:

"- health care institutions must work according to new standards of providing medical care;

- to improve the mechanisms of attracting qualified specialists;

- to increase the effectiveness of medical care, the routing service responsible

for the organization of additional treatment and rehabilitation of discharged patients;

- to ensure continuity of patient management at all stages to improve the quality of medical care;

- to optimize the structure of the industry by uniting low-capacity hospitals and polyclinics and creating multidisciplinary centers;

- to ensure availability for the population of modern effective medical technologies for providing medical care in outpatient settings and in day hospital settings;

- implement modern information technologies, which include electronic document management, electronic medical records and telemedicine."

Investment activity in the health care system is especially important in the context of the introduction of innovations both in the processes of implementation of medical services and in management processes. Accordingly, the state should establish a comprehensive system of support, management, and regulation of investment and innovation activities.

Identification of the properties of this process is important in the development of the investment and innovation mechanism of state management of the health care system. Properties always appear in the classification of the object. Yu. Mochalov notes on this occasion: "From the point of view of innovative management in the industry

health care, several types of innovations can be distinguished:

1. Medical technological innovations associated with the use of new methods (methods, methods) of prevention, diagnosis and treatment based on existing drugs (equipment) or new combinations of their use.

2. Organizational innovations implementing the effective restructuring of the health care system, improving the organization of staff work and the organizational structure of the management process and a separate medical institution.

3. Economic innovations that ensure the implementation of modern methods of planning, financing, stimulation and analysis of the activities of health care institutions.

4. Information technology innovations aimed at automating the processes of collection, processing, and analysis of information flows in the medical field.

5. Medical-pharmaceutical, medical-technical innovations, which are a type of medical technological innovations, but consist in the use of new drugs (technical systems), competitive in terms of price and basic parameters of medical effectiveness."

Among domestic scientists, the issue of innovations in health care was considered by O.O. Yevseeva, it was the author who determined their properties, which were included in the developed classification.

The specified classification takes into account most of the properties of this object of state administration in the health care system, because it is built on the basis of economic, legal, organizational and industry specifics of innovations. The quality and effectiveness of medical services depends on the effectiveness of the state's investment and innovation activities in the health care system, and as a result of solving a number of socio-economic problems in society. Innovative development of

the health care system as a whole and institutions

health care, in particular, is an important strategic position for solving urgent social problems. This is due to the fact that the health care system ensures the quality of the state's human capital as the basis of economic development on the one hand and ensuring social consensus on the other.

Innovations are an extremely important basis for improving the quality of medical services. Thus, one of the problems of the health care system of Ukraine, defined by the "Concept of the Reform of Financing of the Health Care System", is defined as the low quality of medical services, and the following reasons for this have been established: "The reasons for this are not in the quantitative deficit of medical infrastructure (in particular, hospitals, hospital beds and medical workers), and in its qualitative backwardness (lack of modern equipment, outdated approaches to treatment and work organization, insufficient workload) and in an extremely ineffective model of the overall organization of the health care system , primarily in the organization of its financing and management. Significant wear and tear of basic funds, the noticeable lag of medical infrastructure and domestic clinical practice from the requirements of modern European and world standards do not allow shifting the emphasis towards the active and widespread use of new, less invasive and at the same time more effective medical technologies, high-tech equipment and more complex and dynamic knowledge and skills of medical workers, which should be based on the principles of evidence-based medicine. This affects the quality of service provision."

The complexity of innovations in the field under study is that the health care system combines both the actual implementation of the medical service (providing medical care of various levels) and auxiliary industries that operate in both the private and public sectors. That is why, when substantiating the components of the state's investment and innovation activity, we will take it as a basis. In turn, the complexity of the process of implementation of state investment and innovation activities in the health care system is affected by the resistance of the main stakeholders and participants in the implementation of medical services. The native scientist Yu. Mochalov suggested distinguishing two types of resistance: internal and external. Their characteristics presented.

Investment and innovation activities of the state in the health care system are manifested in various manifestations of the participation of state administration subjects in the investment process regarding the introduction of innovations in the health care system. The state is always the subject of investment activity in various guises.

"The state participates in the investment process both directly - through the state sector of the economy, and indirectly - through its institutions: bodies of executive power and local self-government, the National Bank of Ukraine, the State Property Fund of Ukraine, the State Antimonopoly Committee, the State Commission for the Regulation of Financial Services Markets , the State Commission for Securities and the Stock Market. The direct influence of the state on investment is carried out in administrative and targeted forms. The administrative form is direct grant funding, carried out in accordance with special laws. The target form is an element of the system of contractual relations under which agreements are concluded

between the contractor and the customer. This can be specific financing through government targeted investment support programs." Effective investment and innovation activity will be only if all manifestations of the state (direct and indirect influence) are combined.

The investment and innovation mechanism for the implementation of state management in the health care system is connected with a set of other mechanisms, namely:

- financial and economic (manifested in the formation of instruments of investment activities regarding the financing of innovations in the health care system, as well as economic stimulation of the investment of private financial resources in the state health care system for the purpose of its innovative development, which is manifested in tax benefits, subsidies, credit benefits, etc.);

- legal, personnel (manifested in the formation of the legal basis of investment and innovation

state activity in the health care system, as well as state regulation of investment and innovation activities of state health care institutions. It is implemented through the adoption of new and changes to existing laws, resolutions, orders, decrees, regulations, recommendations);

- organizational (consists in establishing communication between various participants of investment and innovation processes in the health care system and determining the functional provisions of the activities of state administration entities, local government bodies, state enterprises, health care institutions);

- informative (forming a positive image of the state's investment and innovation activity in the health care system).

This is important, because the mechanisms of state administration cannot function separately from each other.

In the context of reforming the health care system, we believe that the investment and innovation activity of the state should take place in the following directions and methods. The state, through state administration, can act on different sides of investment and innovation processes in the health care system. In this field, the role of the state is particularly important both in the direct and indirect sense, which is especially relevant in the conditions of medical care reform and the need to modernize the health care system. It is worth noting that in the context of investment and innovation activity in the system of the private medicine market, the state, in the form of state authorities, acts as a regulator of their economic activity, and in certain aspects can act as a partner, provided that the form of investment activity is a public-private partnership. However, in the conditions of Ukraine, investment and innovation activity is important in the system of the state health care system.

In the context of the above, it is worth clearly identifying the role of the state in the investment and innovation processes of the health care system:

1) The state as an investor- creation of investment funds at the expense of the state budget to finance innovations and modernization of the health care system. The current state of funding of the health care system does not fully allow implementing innovative projects and modernizing the processes of providing medical services. However, by increasing the share of the budget for the health care system, scientific

research in the field of medicine is an opportunity to finance innovations in the health care system. Provided that such innovations will improve the effectiveness of the implementation of medical services, the innovative product can be partially or fully implemented by private medicine entities. For the state, on the one hand, this will allow the state to receive income from the state budget, and on the other hand, to improve the quality of medical care.

State financing of innovations in the field of health care is possible both at the expense of the state budget and at the expense of local budgets.

2) The state as a partner- participation of the state through relevant state authorities, state or communal enterprises in various forms of public-private partnership in the field of health care.

The main direction of modernization of health care facilities and formation of an innovative approach to the implementation of medical services is public-private partnership. The implementation of public-private partnership projects in the health care system allows attracting private investment while preserving state ownership. In fact, the state turns from a subject of management and regulator into a full-fledged partner in conducting business, which consists in the implementation of medical services. Subjects that regulate and take part in the formation and implementation of public-private partnership projects in the field of health care are:

- Ministry of Economic Development, Trade and Agriculture of Ukraine;
- Ministry of Health of Ukraine;
- Regional health care administrations;
- United territorial communities.

In the conditions of the development of this type of cooperation between the state and business, there is a need to create an appropriate state body, for example, the National Agency for Public-Private Partnership.

3) The state as a borrower– issuance of government debt securities (bonds) to finance innovations in the health care system. The main direction of attracting additional funds for the implementation of innovations is the attraction of private financial resources through the sale of state bonds, which allow to increase the state budget or cover its deficit, and direct the funds raised to the development of innovations in the health care system. The main types of government bonds according to the Law of Ukraine On Securities and the Stock Market are:

- bonds of domestic state loans of Ukraine ("state securities that are placed exclusively on the domestic stock market and confirm the obligations of Ukraine to reimburse the bearers of these bonds for their nominal value with the payment of income in accordance with the terms of placement of bonds. Nominal value of bonds of domestic state loans of Ukraine can be determined in foreign currency;

- bonds of external state loans of Ukraine ("state debt securities that are placed on international stock markets and confirm the obligation of Ukraine to compensate the bearers of these bonds for their nominal value with the payment of income in accordance with the conditions of placement of bonds");

- treasury bonds ("a government security placed exclusively on a voluntary basis among natural persons, certifies the fact that the State Budget of Ukraine is indebted to the owner of the treasury bond of Ukraine, gives the owner the right to

receive monetary income and is repaid in accordance with the terms of placement of treasury bonds "Yazan of Ukraine. The nominal value of treasury obligations of Ukraine can be determined in national or foreign currency");

- target bonds of internal state loans of Ukraine ("bonds of internal state loans, the issue of which is a source of financing the state budget deficit in the amounts provided for this purpose by the law on the State Budget of Ukraine for the relevant year, and within the limit of the state debt".

The main subjects of regulation, placement and management of government bonds in Ukraine are:

- Ministry of Finance of Ukraine;
- Ministry of Health of Ukraine;
- National Bank of Ukraine;
- Agency for State Debt Management of Ukraine;
- Accounting Chamber of Ukraine;
- Ministry of Economic Development, Trade and Agriculture of Ukraine.

4) The state as a creditor- provision of preferential state loans to finance innovative processes in the health care system. At the level of state regulation of the health care system in the market of banking financial services, it is possible to establish different directions of preferential lending as innovative processes by both state and private banking institutions. The National Bank of Ukraine is the subject of implementation of the specified direction.

5) The state as a regulator– formation of a set of mechanisms for state regulation of investment and innovation activities in the health care system. In this case, the main direction of the state's activity is the formation of a system of state regulation of investment and innovation activities in the health care system, and therefore a close relationship with the legal mechanism of state administration.

The complexity of state regulation of the researched activity is as follows:

- firstly, the investment and innovation activities of the state in the health care system should bring both a social effect (increasing the quality of medical services and as a result of the state of public health) and an economic effect (saving budget funds; income to the state budget, etc.) both for the entire system and for a separate health care facility, patient and public health in general.

"Introduction of theoretical knowledge and developed technologies into practical health care are decisive factors for improving population health indicators and obtaining maximum benefit for patients from modern medical achievements";

- secondly, the state's investment and innovation activities in the field of health care cover various spheres of state regulation, namely: investments as an object of state regulation; Securities Market; innovations; research activities; activity of health care institutions; budget process; local finances and others;

- thirdly, the formation and implementation of mechanisms of state regulation of investment and innovation activity of the state in the health care system covers a large number of subjects of executive and legislative power.

"According to Law No. 40, state regulation of innovative activity is carried out by:

1) definition and support of priority areas of innovative activity at the state,

branch, regional and local levels;

2) formation and implementation of state, branch, regional and local programs;

3) creation of a legal framework and economic mechanisms to support and stimulate innovative activities;

4) financial support for implementation of innovative projects;

5) establishment of preferential taxation of subjects of innovative activity;

6) supporting the functioning and development of modern innovative infrastructure".

The main areas of state regulation of investment and innovation activities of the state in the health care system are:

- formation of a set of measures and legal regulation of investments and innovations in the health care system;
- consolidation at the state level of the main areas of innovative activity in the health care system;
- determination of conceptual provisions regarding investment and innovation activities of health care institutions;
- regulation of scientific activity in medicine with the aim of creating innovations.

6) The state as a manager- manages investment and innovation processes in the health care system through the system of executive authorities. An important factor in the effectiveness of the investment-innovation mechanism of state administration in the field of health care is its relationship with the organizational one, namely, in part, the establishment of interaction between various state administration bodies. The manifestation of the state as a manager encompasses all other aspects of the manifestation of the state in the implementation of the investment and innovation mechanism of state management of the health care system, which is the objective cause of complex information and communication links. In general, according to the above-mentioned manifestations of the state in the implementation of the investment and innovation mechanism of state administration, the entities of state administration that ensure the investment process are determined.

All subjects of investment and innovation activities of the state in the health care system can be represented as follows:

- subjects regulating investment and innovation activities of the state in the health care system;
- subjects whose activities are aimed at managing the investment process of financial support for innovations in the health care system;
- entities that ensure the processes of development and implementation of innovations;
- entities that implement innovations - health care institutions.

Individual subjects of state administration can belong to different groups.

All manifestations of the state in investment and innovation activities in the health care system are components of the investment and innovation mechanism of state management. Each manifestation of the state determines the subjects of state administration. In turn, the object of state administration has the following

inseparable components:

- the investment process and its results. The investment process determines the financial support

development and implementation of innovations in the health care system;

- the innovation process and its results. In this case, the process of development and implementation of innovations in the health care system is determined. The innovative process is manifested in the directions of innovations and their properties.

The main directions of the investment process as a basis for financing innovations in the health care system are the following:

- financing of science;
- public-private partnership;
- issuance of government bonds;
- preferential lending;
- creation of state investment funds;
- other directions.

The indicated directions are characterized by us as part of the manifestations of the state in investment and innovation activities in the health care system. Their range can expand in the context of the emergence of new methods of investment activity. The role of the state, in turn, is manifested both as a regulator of the specified directions and as a subject of their implementation. In the conditions of reforming the health care system and the need for its innovative development, we consider it necessary to create directorates of innovative health care development in the structure of the subjects of state management of the health care system (Ministry of Health of Ukraine; National Health Service of Ukraine) the main functions that should become:

- formation of the innovative development strategy of both the state as a whole and individual regions or institutions;
- determination of sources of financing innovations (investments) in the field of health care;
- formation of priority areas of innovative development of the health care system;
- informational, organizational, legal support of investment and innovation projects in the health care system;
- management of information and communication links between subjects of investment and innovation activities of the state in the field of health care;
- development and implementation of methodological recommendations regarding investment and innovation activities of the state in the field of health care;
- development, assessment and implementation of public-private partnership projects in the field of health care;
- development and implementation of the methodology for evaluating the effectiveness of investment and innovation projects and innovative development of health care institutions.

The following are the main directions of the innovation process in the health care system:

1) Innovations in the management process are innovative methods, tools, and measures to improve the management of the health care system as a whole and its individual components. Examples of innovations in the management process, which are becoming especially relevant today in the conditions of reforming the health care system, are:

- implementation of information and computer technologies in parts of the management of health care institutions and information and communication links between them;
- expansion of the range of medical services, especially in the prevention and diagnosis of diseases;
- creation of innovative units for the management of public health in the region and the country as a whole.

2) Innovations in the process of organization of medical services are innovative approaches to the organization of medical services (medical care) in health care institutions and establishment of information and communication links for medical purposes between them. Especially important for Ukraine today is the lack of an effective system for exchanging information about treatment methods and the state of health of patients. These problems are caused by paper medical history. That is why a special direction of introducing innovations into the organizational process is the creation of databases:

a) with the patient's medical history (information and computer technology that allows storing and transferring the patient's medical history as needed, especially if it concerns the need for specialized medical care). Its implementation will allow to quickly respond to the course of the disease and treatment and involve specialists from different regions and health care institutions;

b) with innovative methods and examples of disease treatment and diagnosis;

c) with experimental methods of treatment;

d) with the results of monitoring the state of public health (especially in some diseases that are under special control of the state: HIV / AIDS; hepatitis; tuberculosis) or lead to an epidemic (pandemic), for example, COVID-19);

e) with data on specialists in various specialties, with the aim of involving them in the treatment of patients.

3) Innovations in medical care (treatment process) – all types of innovative and experimental treatment, the latest medical technologies and new medical drugs.

4) Innovations in medical education are innovative approaches to teaching specialized disciplines and the use of innovative technologies in the educational process. An example can be the anatomical table, which was developed and is effectively used by the Faculty of Medicine of the Black Sea National University named after Peter Mohyla. These innovations are implemented in institutions of higher education.

5) Innovations in other areas can be represented by the introduction of innovative methods in laboratory research.

Certain aspects of innovative activities related to the implementation of information and computer technologies were introduced in the context of the reform that began in 2015, in particular e-health. "The electronic health care system (e-

health) is a project of the Ministry of Health, which is currently at the development stage. The first stage of this development involves the introduction of electronic systems to support procurement of PMD services. Currently, the system serves primarily for financial and payment purposes, and does not act as a full-fledged electronic health care system with electronic medical records. The electronic health care system (e-health) includes certain modules that allow the National Health Service to conclude contracts with providers (electronic conclusion of contracts with PMD service providers and pharmacies), register the citizens' choice of PMD doctors (electronic declarations) and carry out reimbursement of medicines within the framework of the "Affordable Medicines" program (electronic prescription)".

We propose to approve the specified areas of innovative activity at the state level by the Resolution of the Cabinet of Ministers of Ukraine on Approval of promising areas of innovative development of the health care system. We propose to define the following ways of ensuring such innovations for the above-mentioned directions of innovative development: funding of science; public-private partnership; issuance of government bonds; preferential lending; creation of state investment funds; other directions.

The order of interaction between various subjects of state administration should become an important part of the resolution.

Conclusions. Thus, the properties of the investment and innovation activity of the state as a mechanism of state management of the health care system are substantiated. The structure of such activity has been developed, which provides for various manifestations of the state and, as a result, the procedure for establishing information and communication links between various subjects of state administration. Established directions of innovative development of the health care system.

1. The introductory part. It should be short and concise. It is written after drawing up the plan. In addition to the name, address of the company, its organizational and legal form, the composition of the participants, the characteristics of the project, its main goals, the cost and financing needs are indicated.

2. Analysis of the state of affairs in the field of work carried out on the project. This section provides an analysis of the current state, trends and forecast of the development of the field of application of innovations (tourism, means of accommodation). The strengths and weaknesses of the latest innovations and possible competitors, as well as likely categories of consumers are listed on which the project is designed.

3. The essence of the proposed program. It is necessary to give a clear definition and description of the new or improved product (service, technology, direction of travel) that will be offered on the market, its uniqueness or distinctive features. It is necessary to indicate some aspects of the necessary changes for the production and provision of these services and the possibility of their improvement.

4. Market analysis and marketing plan. In this part of the business plan, you should define the market or its segment, where you can organize the successful implementation of the proposed product, and the expected structure of possible consumers of the service. It is necessary to assess the competitiveness of the new

product in terms of quality, price, sales channels and other indicators, as well as the capabilities of competitors. Specific details of the marketing strategy are also indicated: methods of product promotion, advertising, price policy, etc.

5. Production plan. The production processes that use information technologies, the additional equipment needed to equip workplaces, the number of new employees, new sales points and other issues related to the production and sale of the product are indicated.

6. Organizational plan. The form of ownership of the company is indicated, its structure, the scheme of the organization of product sales, the number and qualifications of personnel (the need for their training, the involvement of consultants from the outside) are indicated.

7. Assessment of the degree of risk. Objectively, the main characteristics of risks related to the implementation of the project, the presence of real and possible potential threats that pose a danger to the company, and the possibilities of overcoming risky situations are presented.

8. Financial plan. The most important component of the business plan, it includes: planned sales volume, income and expenses, forecast of cash receipts and profit in the next two to three years, balance of expenses and income for the first year, other indicators.

9. Programs. Include documents that are mentioned in the business plan or reveal the content of the innovation program.

The effectiveness of an innovative project is usually evaluated based on the financial, social and other benefits that its participants receive. They distinguish between commercial, budgetary and national economic efficiency. Commercial efficiency reflects the financial consequences of project implementation for its direct participants; budgetary - financial consequences of project implementation for federal, regional and local budgets; national economy takes into account costs and results associated with the implementation of the project for the industry or the national economy as a whole.

Materials for self-control:

AND. Questions for self-control:

1. What is an innovation strategy?
2. Name the types of state innovation strategies.
3. What are the differences between different types of enterprise innovation strategies? 4. Competition and its impact on the innovation management process.
5. Functions of innovation planning.
6. Name the sequence of actions in the development of innovative projects.
7. Business plan of an innovative project.
8. Sources of investment in innovation processes.
9. Organization of innovative activities.
10. Management of innovations.
11. Creation of innovations and their implementation.

B. Test tasks and tasks

Summing up.

List of recommended literature

Main:

1. Gutorov O.I. Methodology and organization of scientific research: study guide. Kharkiv: KHNAU, 2017. 272 p.
2. Danilyan O.G., Dzoban O.P. Organization and methodology of scientific research: teaching. manual Kharkiv: Pravo, 2017. 448 p.
3. Degtyarev A.V., Kokodiy M.G., Maslov V.O. Fundamentals of scientific research: a study guide. Kharkiv: KHNU named after V. N. Karazina, 2016. 78 p.
4. Kostyukevich V.M., Konnova M.V. Methodology of scientific research: study guide. Vinnitsa. 2017. Vol. 172.
5. Malyhina V.D. Methodology of scientific research. Rivne. 2016. 247 p.
6. Methodology of scientific research: teaching manual. / V.I. Zatserkovnyi, I.V. Tishaev, V.K. Demidov – Nizhyn: NSU named after M. Gogol, 2017. – 236 p.
7. Methodology of scientific research in medicine: teaching. manual / V.D. Babajan, N.S. Bakumenko, O.I. Kadykova and others; under the editorship P.G. Kravchuna, V.D. Babajana, V.V. Meat eater. – Kharkiv: KhNMU, 2020. – 260 p.

Additional:

1. The Law of Ukraine ―On Innovative Activity‖. VVR – 2002 #36.
2. Vasylenko V.O., Shmatko V.G. Innovation management. - K.: TsUL, Phoenix, 2003.
3. Mochalov Yu. Innovative activity in the work of health care institutions. Practice of managing a medical facility. 2014. No. 3. P. 28-37. URL: https://dspace.uzhnu.edu.ua/jspui/bitstream/lib/23597/1/Pages%20from%20Mediki_3_2014_inet.pdf
4. On the approval of the Concept of reform of the financing of the health care system No. 1013 dated November 30, 2016. URL: https://www.kmu.gov.ua/npas/249626689
5. On securities and the stock market: Law of Ukraine dated February 23, 2006 No. 3480-IV. URL: https://zakon.rada.gov.ua/laws/show/3480-15#n25
6. Svintsitsky A.S., Vysotska O.I. Current issues regarding the implementation of innovative medical technologies in health care institutions. Practitioner. 2015. No. 1. P. 7-13.
7. Ukraine: review of the health care financing reform 2016–2019. Joint report of WHO and the World Bank. URL: https://www.euro.who.int/__data/assets/pdf_file/0018/425340/WHO-WB-Joint-Report_UKR_Full-report_Web.pdf

Electronic information resources:

1. Best Evidence. URL: http://www.bestevidence.com/
2. BritishMedicalJournal. url http://www.bmj.com/specialties/evidence-

based-practice
3. CanadianMedicalAssociation. URL: http://www.cma.ca/
4. Center for Evidence-based Medicine at the University of Oxford. URL: http://www.cebm.net/
5. Clinical Evidence. URL: http://clinicalevidence.bmj.com/x/index.html
6. Cochrane Collaboration open learning material for reviewers. URL: http://www.cochrane-net.org/openlearning
7. Cochrane Library. URL: http://www.thecochranelibrary.com/
8. Current Controlled Trials. URL: http://www.controlled-trials.com/mrct
9. eGuidelines. URL: http://www.eguidelines.co.uk/
10. Evidence-Based Medicine. URL: http://ebm.bmj.com/
11. Canada Clinical Guidelines Database. URL: http://www.phac-aspc.gc.ca/
12. JAMAEvidence. URL: http://www.jamaevidence.com/
13. Medscape. URL: http://www.medscape.com/
14. National Institutee for Clinical Excellence. URL: http://www.nice.org.uk/
15. PRODIGY (Clinical Guidance). URL: http://prodigy.clarity.co.uk/