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ФИЗИКО-МАТЕМАТИЧЕСКИЕ НАУКИ

PHYSICAL AND MATHEMATICAL SCIENCES

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QUANTUM PHYSICS AND THINGS OF SPACE

Annotation.

The results of investigations of the strangeness of quantum physics in the framework of a simulated system of interaction of matter with space are presented. The features of the behavior of particles inhabiting the Standard Model in the process of their movement in the power filaments of space are shown. Quantum entanglement, Pauli's principle, particle tunneling and Heinsberg's uncertainty are considered from the point of view of force filaments.

Key words:

Standard Model; power threads; oddities; quantum entanglement; tunneling; compression; potential barrier; expansion; electron; proton.

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Introduction

The founder of quantum physics is the German scientist Max Planck. He carried out observations of the radiation of a black body and came to a conclusion. Energy is emitted discretely, in portions - quanta. The energy of a quantum is determined by the frequency of the electromagnetic wave. Schrödinger and Niels Bohr were at the forefront of quantum physics.

Quantum physics describes the processes, phenomena, patterns occurring at the micro level. Its subjects are quantum objects: molecules, atoms, nuclei of chemical elements, elementary particles. She studies matter at a fundamental level. Therefore, its positions are difficult to perceive, in contrast to objects studied by classical physics.

Quantum physics was able to explain the phenomena of the microworld, where laws "strange" for our understanding reign, which are impossible from the standpoint of classical physics. According to its provisions [1.c.89], elementary particles possess wave - corpuscular dualism and, depending on specific conditions, behave like a wave or like a particle. Thus, an electron in an electromagnetic field appears as a particle, and in a crystal it moves as a wave. One of these oddities is the uncertainty principle. Its essence lies in the impossibility of simultaneously accurately determining the coordinates and momentum of a microparticle. If the value of one of the quantities is precisely determined, the value of the second will remain undefined, and vice versa.

Examples [2.p.334] of the oddities of quantum physics are the motion of an electron cloud in atomic space and "ghostly" entanglement. The electrons in the atom do not move along stationary orbits, but are "smeared over atomic space." Therefore, define simultaneously the exact location of the electron and its momentum is not possible. They talk about the likelihood of its presence in a certain place in atomic space. The concept of ghostly entanglement implies the statement that a pair of photons react to their state, being at a distance from each other. The creation of the theory of chromodynamics, the predictions of which have been confirmed experimentally, is an important achievement of quantum physics.

Using quantum mechanical properties, scientists have succeeded on fundamentally new concepts, to learn the nature of elementary particles [3.p.228], to rethink many physical phenomena. Based on the results obtained using the predictions of quantum physics, scientists hope

on its basis to solve the accumulated problems in atomic physics. However, many physicists do not share their optimism and believe that the capabilities of quantum mechanics, as a scientific theory of worldview and matter, have limited capabilities.

In this article, we will try to get answers to these problems with a simulated system based on the following principles.

Modeling technique

The realities (R) of the surrounding world are the result of the interaction of matter with space.

R = W + P where W is matter, P is space

E - energy, this is a form of the relationship of matter and space

The space in the modeled system is represented by aggregates of prostones, collected in "power threads", which form a kind of "network", evenly tense in all directions due to the repulsive forces of the same charges.

Matter in the modeled system is a collection of gravitons located in a certain way between power threads of space. An indivisible particle of matter is a positively charged graviton, and a negatively charged space is just proston.

The form of the relationship of matter with space is energy. It is presented in two forms: the energy of matter (Em) and the energy of space (- Ep.), Which mutually transform into each other ..

Particles and bodies move in the power threads of space and deform them. The proton compresses, and the electron expands the power filaments of space, this is their similarity and difference. The proton is 1840 times heavier than the electron, the particles have the same charge, but different in sign

In the modern world, physical processes and interactions take place with the direct participation of the energy of matter and the energy of space. They serve as the basis for the formation of various types of energy and the ways of their transition from one type to another.

Research findings

Investigations of some provisions of quantum physics within the framework of a modeled system give the following results.

1.Standard model and threads of space

The main constituent particles of the Standard Model are six types of quarks, six leptons, five bosons. .

Quarks. In the beginning, quarks were theoretically predicted as fundamental particles that cannot be divided into pieces, and then they were discovered experimentally. To make the calculations of the theoretical model workable, the electron charge was fragmented, although it is considered elementary, it was proposed that one type of quark had a positive electron charge of 2 / 3 of the electron charge, and the other would have a negative electron charge of 1 / 3. Currently, 6 types of quarks are known: u. d. s. c. b. t. The up quark u quark has a charge of + (2 / 3) e. Quark d the bottom quark has a charge of - (1 / 3) e. The quark s strange quark has a charge of - (1 / 3) e. The charmed quark c quark has a charge of + (2 / 3) e. Quark b A pretty quark has a charge of - (1 / 3) e. Quark t A true quark has a charge of + (2 / 3) e. Quarks have antiquarks. They are divided into generations: u and d are quarks of the first, s and c are quarks of the second, b and t are quarks of the third generation.

A quark is an integral part of other particles and cannot exist separately from other quarks. Quarks receive "packets" of energy from neighboring quarks and send them to other quarks themselves. These packets are called gluons, if they do not receive them, they become virtual

particles and disappear. Gluons are carriers of strong nuclear forces. Strong interaction up to a certain limit enhances its effect on quarks, the further they move away from each other, the stronger it acts on them. In order to tighten the quarks more strongly, the strong interaction creates more and more gluons. Gluons are massless bosons with spin equal to 1. As a result, we can draw the following conclusion. On the basis of theoretical and experimental developments, new quark particles were discovered, which are the constituent parts of hadrons, including protons and neutrons, which are part of the nuclei of all atoms of the periodic table. But is it really so, let's try to comprehend it from the position of the power threads of space.

The proton consists of two quarks u one d quark. A neutron consists of two d quarks and one u quark. The proton charge is positive and is +1. The neutron has no charge, it is neutral. In order to preserve the magnitudes of the charges of these particles, fractional charges were attributed to the quarks forming these particles. Traditional physics has no clear explanation of what a charge is. What parts does it consist of and is it possible to split it. It turns out the first non - docking. Further, the proton consists of two quarks u and one d quark. A neutron consists of two d quarks and one u quark. This shows that they differ from each other in quarks. The proton has an "extra" quark u, and the neutron has a quark d. But if we compare their masses, we get a difference of 2.78 MeV / sec2 .. The neutron decays into a proton, an electron and an antineutrino. Therefore, the d quark must have a mass equal to the masses of an electron and an antineutrino. The mass of the antineutrino is negligible, so we take only the electron mass of 0.511 MeV / sec2 for calculations ... It turns out that the mass difference is almost six electron masses. At the same time, the magnitude of the electric charge of an electron is - 1, and that of a quark is (1 / 3) e. The second is not a docking. Thus, the main version of the theoretical model of quarks that they are fundamental, that is, indivisible, is apparently not consistent.

Let's try to prove it as follows. If we assume that quarks consist only of gravitons or of protons, then we get the following. Quarks u. c and b (Fig. 1.a.d. i) consist of gravitons, and quarks d. s and b (Fig. 1 b. c. f) consist of prostones. The first quarks will contract, and the second ones will expand the lines of force. In this case, there will be no need to introduce fractional charges. Quarks are parts of the structure of the particles that make up them. We present this statement using the following examples.

Proton consists of three quarks: two u - quarks and one d - quark. The pressure inside the proton is directed from the periphery to the center (Fig. 1.m). It is colossal and amounts to 1035 Pa, the compression ratio of the power filaments reaches 10 - 30 m. The proton is spherical. It has an entrance and an exit, through which the force filaments penetrate it as it moves along them. The functions of the quarks that make up the proton are different. The u quarks compress the power threads, while the d - quark expands them. But there are two of them, so the proton compresses the strands of force. (Fig. 1.k). As a result of compression, the energy of space is released, which is converted into the energy of matter. These are the same "packets" of energy that quarks are constantly exchanging with each other. The packets are called gluons. For quarks to be at a certain distance from each other, a certain amount of energy packets must be released continuously. The function of the d - quark is that it reduces the degree of compression of the force lines by the u - quarks and thus regulates the energy release of the gluon to the required limits

Neutron consists of two d - quarks and one u - quark (Figure 1.n). It has a globular shape. It also has an entrance and an exit, where the force filaments pass through the neutron as it moves along them. Quarks are arranged inside the neutron in such a way that their effect on the force filaments

passing through the neutron does not change their degree of compression (Fig. 1. y). The pressure inside the neutron is directed from the center to the periphery. The degree of compression of the force filaments is 10 - 25 m

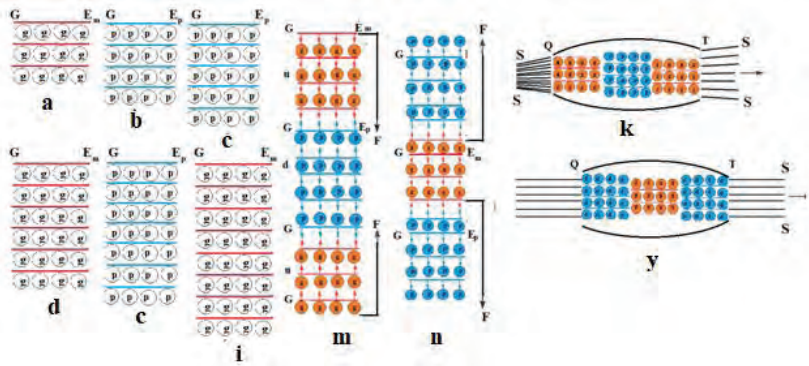

Fig. 1. Supposed schemes of the structure of quarks and particles
a - quark u b - quark d c - quark s d - quark c e - quark b i - quark t m and n - proton k and y – neutron G - gluon Em - energy of matter Ep - energy of space T – input Q – output F - pressure S - force thread g - graviton p - proston.

Leptons. As you know, there are three generations of leptons. First generation electron and electron neutrino. Second generation muon and muon neutrino. Third generation tau - lepton and tau neutrinos. The muon is 207 times heavier than the electron, and the mass of the tau - lepton is 1780 MeV. Of all the charged leptons, only the electron is stable, the rest quickly decay into lighter leptons. All neutrinos are considered stable. They do not have zero mass, they have oscillation. The mass of an electron neutrino is less than 1Ev. The masses of other neutrinos are still unknown. Leptons, together with quarks, constitute a class of fundamental particles that make up matter. According to existing concepts, no internal structure has been found in leptons. but there are attempts to construct theories in which leptons are composite objects.

Formed modern idea of leptons, we will try to clarify and deepen from the point of view of the modeled system.

According to the basic principles of this system, the electron has an internal structure consisting of several proston (Fig. 2. b). Consequently, it cannot be divided into parts, but it can decay into particles (prons), as happens during annihilation with a positron. It has a spherical shape. It has an entrance and an exit. Force threads pass through it as it moves through them. Prostons are arranged inside the electron in such a way that their effect on the force wires passing through the electron changes their degree of compression. It is lower at the input than at the output (Fig. 2.c.), That is, as the electron moves along the force strands, they expand.

As for the electron neutrino, we can make the following assumption. It consists of one graviton and two prons (Fig. 2.d), so its mass is so small and it has a super - high penetrating power. The other types of neutrino - muon and tau - neutrinos, respectively, consist of two and three gravitons surrounded by four and six protons. Neutrinos move in the force filaments, compressing them in the direction of their motion. This releases matter energy, which allows the particle to travel long

distances through space and travel great distances. For example, the relic neutrinos left after the Big Bang. Neutrinos have interaction properties. They can spontaneously transfer into each other. The figure (Fig. 2. e) shows the transition of a tau neutrino into a muon neutrino, which turns into an electron neutrino.

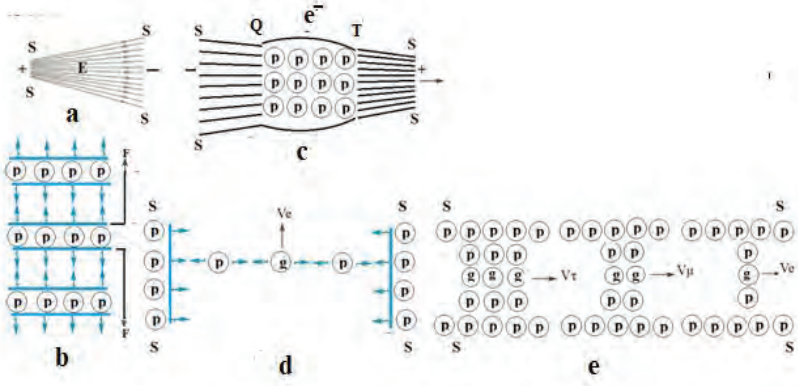

Fig. 2 Supposed schemes of the electric field, the structure of particles and the scheme of their movement in the power filaments
a - schemes of the electric field b - schemes of the internal structure of the electron c - schemes of the movement of an electron in the power filaments d - schemes of the movement of neutrinos in the power filaments e - schemes of the transitions of neutrinos Vτ - tau neutrino Vμ - muonic neutrino Ve - electron neutrino T - input Q - output E - electric field e - electron

Bosons Despite the huge variety of physical processes, phenomena, laws occurring in nature, according to the modern ideas of scientists, four types of fundamental interactions dominate in it. All fundamental interactions are carried out with the help of intermediate particles, which are called carriers. For electromagnetic interaction, such a particle is a photon. The carriers of the strong interaction are gluons, and the weak ones are Z0, W +, W - bosons. In the case of gravitational interaction, such a particle has not yet been experimentally discovered. All known carriers are bosons. It is believed that when two particles interact with the help of a third particle, they exchange energy and momentum with each other, but the exchange mechanism itself is not fully disclosed. Let's try to do this using the basic principles of the modeled system.

Electromagnetic interactions occur between charged bodies, particles with the help of electromagnetic fields. This field is a network of strands of force with

Fig. 3.a). A striking example of electromagnetic interaction is the interaction between a positively charged nucleus and a negatively charged electron cloud in atoms of chemical elements. Electrons moving in the filaments of the intra - atomic space expand them. As a result, the energy of matter is released in the form of photons. Protons compress the force threads in atomic space. At the same time, the energy of space is released in the form of photons. The resulting photons are in antiphase. They cancel each other out, so atoms do not emit energy when they are in the ground state..

The strong interaction is manifested in u - and d - quarks located inside protons and neutrons, protons and neutrons are continuously moving in the force strands of intranuclear space, gravitons composing u - quarks compress them, and protons composing d - quarks expand them. As it moves along the force strands, the free neutron accumulates additional energy within itself. The energy of space Gluons appear continuously and discretely. They bind gravitons and protons within nucleons and prevent them from decaying..

Weak interactions manifest themselves in decay processes. The best known example of weak interaction is the decay of the β - neutron. The neutron

is an integral part of the nucleus and along with the nucleus it moves continuously in the force threads. The two d - quarks entering it expand the force lines, while the u - quark compresses them. In this case, packets of energy gluons are formed. Quarks exchange them with each other, and with their help, pressure is created inside the neutron. Here it is directed from the center to the periphery (Fig. 2.b). Inside the nucleus, neutrons do not decay. From this they are held back by the packets of gluons they receive from their neighboring protons. The free neutron decays quickly. This happens in the following way. As it moves along the force strands, the free neutron accumulates additional energy inside itself. When a certain limit of this energy is reached, the internal pressure breaks the neutron into quarks. One of the d - quarks accumulates some of the matter energy and turns into a u - quark. From the remaining most of the energy, the W boson is formed. The boson decays into an electron and an electron antineutrino. The rest of the boson mass is again converted into space energy.

Gravitational interaction is the interaction of bodies with mass. The carrier of this interaction is the degree of contraction of the force threads surrounding the body of space. Deformation of the force threads requires energe consumption. In order to produce it, some of the mass must be converted into energy. It is customary to measure mass in grams. It follows that a body could deform the force filaments of the surrounding space, it must "lose" a "certain" amount of its mass. The loss of body mass per 1 gram for compression of force filaments is 0.6 - 10 - 16. Table 1 shows the energy consumption for compression of the force threads of the space surrounding objects due to loss of mass by the object

Table 1

Object name	Object mass, grams	Distance between the filaments on the surface of the object, cm	Energy consumption for compression, GeV	Boundaries of effective attraction of the object. km / a.e.
neutron	$1{,}71\ 10^{-24}$	$2{,}5\ 10^{-29}$	$1{,}71\ 10^{-39}$	**$6.7\ 10^{-170}$**
proton	$1{,}6510^{-24}$	$1{,}910^{-29}$	$1{,}6510^{-39}$	**$6.1\ 10^{-170}$**
Earth	$6\ 10^{27}$	$7{,}2\ 10^{-24}$	$6\ 10^{12}$	**$1{,}08\ 10^{6}$**
Sun	$2\ 10^{33}$	$2{,}3\ 10^{-27}$	$2\ 10^{21}$	**$3.6\ 10^{11}$**

or gravitational interaction, the radius of action is infinite. Its carrier is the degree of compression of the force filaments. It has no rest mass. It is quanta of thermal energy converted into space energy and stored in the power filaments.

The gravitational efficiency of bodies is the distance limit at which a body has a predominant gravitational effect on other bodies, on the surface of which the degree of compression of the power filaments is lower than that of this body.

The Higgs field occupies an important place in the Standard Model. It is believed that elementary particles acquire mass by interacting with this field. The stronger this interaction, the more mass a particle acquires, and vice versa. Quantum of this field is Higgs boson.

Within the framework of the theory of interaction of matter with space the world network of space threads is ideally suited to perform functions of the Higgs field. When elementary particles move in them, a large amount of energy is released, which is spent on connections between gravitons and protons that make up these particles. This assumption is confirmed by experimentally determined values of quark masses inside nucleons. The mass of quarks is only 1 % of the total mass of the proton. The rest of its mass is formed from the energy generated by the contraction and expansion of the e. space threads

An important task of modern physics is to create a unified theory that unites all interactions. And there are already some successes. Scientists have managed to combine weak and electromagnetic interactions. Attempts are being made to create a theory of combining electromagnetic, weak and strong interactions,

In terms of basic principles of the system being modeled, all fundamental interactions presumably can be combined by means of force threads. From the data in the table it is seen that a neutron with a mass of 1.674,927 ·10 - 27 kg at a distance of 6.7 - 10 - 170 cm can gravitationally attract a proton with a mass of 1.672,621 - 10 - 27 kg. This gives the right to suggest that at a force of threads are compressed to a degree of 2.5 10 - 29 cm, the gravitational forces and nuclear forces will become equivalent. But for this it will be necessary to apply a colossal amount of energy, trillions of trillions of electron - volts. Modern accelerators cannot do this. Therefore, at the present stage of the development of physical science, the solution of this problem requires the development of theories on a fundamentally new basis.

Uncertainty of Heisenberg and the thread of space.

Heisenberg's uncertainty sets a limit to the accuracy of the simultaneous determination of a pair of quantum characteristics of particles. The more accurately one characteristic of a particle is measured, the less accurately the second can be measured.

Within the framework of the modeled system, this can be explained by examples of the interaction of electron clouds with atomic nuclei. The total mass of a proton consists of the rest mass and the mass of motion. Nucleus protons compress the threads of atomic space. For compression, they expend energy, which they acquire as a result of the conversion of the mass of motion into energy. When electrons move in the power filaments of atomic space, they expand them. This releases the energy spent on their compression by protons. The protons absorb the released energy and their mass remains the same. Then the cycle repeats. The processes of contraction and expansion in atomic space are dynamic. The density and direction of compression change at sub - light speeds. The electrons always move in the direction of the increased compression ratio. Their momentum is determined by the magnitude of the compression ratio. Therefore, it is not possible to accurately determine the location of a particular electron and its energy.

Quantum entanglement and threads of space.

One of the oddities of quantum physics is ghostly entanglement. Its essence is that if you connect two elementary particles together, they will react to each other's state, even at a distance. Most experiments use photons,

Let's consider this phenomenon in terms of threads of space on the example of photons connected with each other. A photon in a free state has 5 degrees of freedom of movement. Two coordinates, wavelength and spin of linear and circular polarization. In the bound state, photons have already 3 degrees of motion.

Their total spin is zero. Photons are carried along the lines of space. If they carry the same amount of energy, they have the same wavelength and contain the same number of strands of space. Therefore, even if they are removed at a distance from each other, they will still be connected by power threads. If we change the polarization of the spin of one photon to the opposite, then the second photon should change the polarization of the spin to the opposite. Because, together they can move in space if their spin is zero. The change in the spin of the second photon will happen "instantly", but this will not mean that the transfer of information has occurred faster than the speed of light [5.p.126]. This will be the response of the filaments to the change in the spin of the first photon.

Pauli's principle and threads of space

Pauli's principle [4.p.134] in quantum physics occupies a special place, It allows a deeper understanding of the nature of matter. The principle imposes a ban only on particles with half - integer spin. The prohibition states that two electrons cannot, and are simultaneously in the same quantum mechanical state in an atom or molecule. They must differ by at least one quantum number. But, what caused such a requirement is not explained. Let's try to understand this using the provisions of the modeled system.

For atoms of chemical elements in the ground state, only two electrons with different spins can fit in the first 1s orbital, the lowest in energy. One with an upper spin and the other with a lower spin. The first electron expands the strands of space clockwise, and the second electron expands them counterclockwise. As a result, the expansions occur in opposite directions, and they do not intersect. The energy released in this case is absorbed by the protons, and they again compress the filaments of space, while the electrons expand. And such cycles are repeated over and over again. Placing other electrons in this orbital is impossible. The directions of expansion of the force filaments by the electrons located here will intersect, and the cycles of compression and expansion of the force filaments will be broken, so other electrons will populate other orbitals.

Quantum electrodynamics and filaments of space

Quantum electrodynamics includes quantum mechanics and electric field theory. It explains the thermal radiation of bodies, the scattering of X - rays, the absorption and emission of photons by atoms. She considers the electromagnetic field as a substance carried by photons. It is believed that the repulsion of particles with the same charges occurs with the help of virtual particles that surround these parti.

For example, one of the protons emits a virtual particle, it hits another proton and causes it to be repulsed. Let us consider this version from the position of the power filaments of space using the examples of two protons and two electrons.

The third figure shows the schemes of repulsion of positively charged particles of protons (Fig. 3 a) and negatively charged particles of electrons (Fig. 3. b). In the upper part of the figure, the

particles move toward each other along the threads of space. Protons compress the filaments, and electrons expand *them.* The middle part shows the meeting zone of the deformed filaments of space. . It is located at the same distance from the centers of the particles. Here, due to the different direction of the deformation of the force threads, forces (F) arise that prevent the deformation of the force threads in this zone. Under the action of these forces, the spin orientations of the particles change, and they begin to move in opposite directions

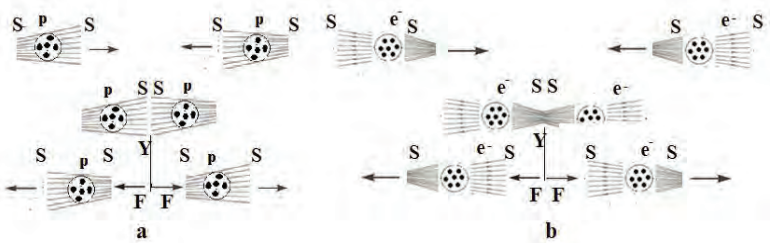

Fig. 3 Scheme repulsion of homonymous charges
a - protons b - electrons Y - the zone of meeting of the filaments deformed by particles F - force, e - - electron p - proton

Quantum tunneling and threads of space.

Quantum tunneling is a physical phenomenon that, from the point of view of classical physics, should not occur. But it happens in nature and modern technology. Known examples of quantum tunneling are transitions by electrons of barriers with higher energies than theirs, as well as nuclear reactions, where particles with the same charges must overcome an energy barrier before merging.

Quantum tunneling, one of the most important tasks that solved by physicists. But, in our opinion, the essence of the tunneling mechanism itself has not yet been revealed. Let's consider this issue in the framework of a modeled system using the following examples.

According to the provisions of classical physics, if the energy of the particle E is less than the height of the barrier U0, then it cannot pass through the barrier, because the energy conservation law will be violated. According to the provisions of quantum physics, the penetration of a particle in this case is probabilistic. That is, the particle has some chance of being on the other side of the barrier. Such a probability can be realized provided that there are power threads in the thickness of the barrier, the degree of compression of which will be higher on the other side of the barrier. As the electron moves in the filaments of space in the direction of a higher degree of compression, energy will be released. As it moves, the energy potential of the electron will grow due to the influx of this energy to it. If the thickness of the barrier allows, then the electron will safely pass through the barrier (Fig. 4). This option is quite possible, considering that in the most solid body there is an order of magnitude less emptiness than matter. Another example is the overcoming of the Coulomb repulsive forces of two protons in the proton - proton cycle during the fusion of nuclei of light elements. At the beginning of the cycle, the degree of compression of the filaments in stellar space reaches such values that moving in them, the protons receive an additional influx of energy. This

allows them to overcome the Coulomb barrier when they meet and unite. In this case, one proton decays and turns into a neutr

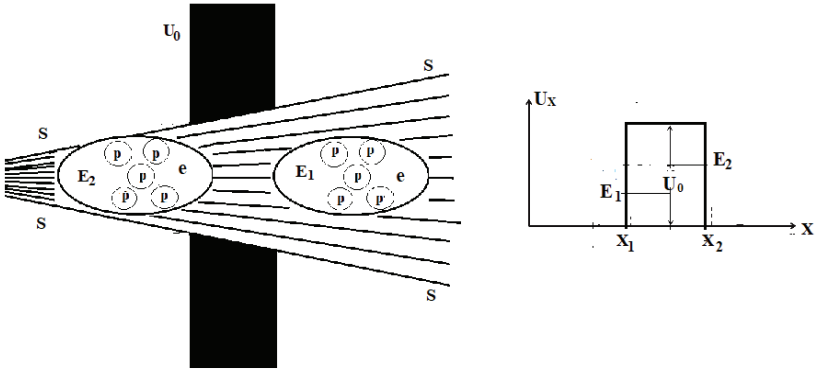

Fig. 4 Scheme of overcoming the energy barrier by an electron
S - thread of space E1 - electron energy before passage E2 - electron energy after passage
U_0 - energy barrier $E_1 < U\ E_2 > U$ e –electron

Findings

Investigation of the “oddities” of quantum physics from the perspective of the force filaments clarifies and complements the understanding of their properties. Allows you to more fully reveal their essence ..

1. The standard model includes quarks, leptons, bosons. Quarks u. c and b are made up of gravitons, and quarks are d. s and b are made up of prostones. The first quarks contract, and the second ones expand the power filaments of space. As a result of compression and expansion of the strands of space, energy is released . This is the very "packets" of energy that the quarks are continuously exchanging with each other. The packets are called gluons. Leptons consist of negatively charged particles of prostons .They cannot be divided into parts. An electron neutrino consists of one graviton and two prostones. It has an insignificant mass, It moves in threads of force, free from particles of matter, therefore it has a high penetrating ability. Bosons are carriers of interactions. The carrier of the gravitational interaction is the degree of compression of the force filaments of space. It has no rest mass. These are quanta of thermal energy converted into energy of space and conserved in the power filaments.

2. Electromagnetic interactions between the electron cloud and atomic nuclei occur cyclically. Proton nuclei compress the strands of space and consume energy.. Electrons expand them, resulting in energy released. The protons absorb it and compress it again. The processes of compression and expansion of the power filaments are dynamic. Electrons always move in the direction of increased compression ratio. Therefore, their energy potential changes rapidly, so it is impossible to measure exactly the energy and location of a particular electron at the same time.

3.Photons of light are carried along the threads of space.. Bound photons have 3 degrees of motion: two coordinates and a wavelength. Their spins are opposite, so the total spin is zero. They are connected with each other by power threads. If they are spaced apart and change the

polarization of the spin in one, then in the other it will instantly become opposite. They can be linked if their total spin is zero. This is the essence of the phenomenon of photon entanglement.

4. All atoms, starting with helium, have two electrons with antiparallel spins in the lowest energy orbit. The first electron expands the strands of space clockwise, and the second electron expands them counterclockwise As a result, the expansions occur in opposite directions and they do not intersect. With this method of movement, electrons do not meet. This is Pauli's ban.

5. When particles with similar charges meet, their repulsion from each other occurs under the action of forces arising from the contact of power threads having different directions. Under the action of these forces, the spins of the particles change to the opposite orientation, and they begin to move in opposite directions.

6. Examples of particle tunneling are the penetration of an electron through a barrier, the energy potential of which is higher than the energy potential of the electron. And also the fusion of protons in nuclear reactions taking place in the bowels of stars. In both cases, the particles move in threads of space and receive an additional influx of energy. As a result, the electron penetrates the barrier, and the protons overcome the Coulomb attraction forces and unit

Literature

1.Baranovsky V.I. Quantum - chemical calculations of increased accuracy, - textbook - St. Petersburg State University, 2015. - p. 89

2. Davydov A.S. Quantum mechanics. - Science, 1973 . - - p. 334

3. Z. Nikamura et al. (Particle Data Group). Review of Physics of Elementary - Particles (eng.) 2010, Vol. 37 p. 228

4. Pauli V General principles of wave mechanics. - M. - L. : GITTL, - 1947, p. 134

5. Khrennikov A.Yu. Introduction to quantum information theory Fizlit, 2003 -

МЕДИЦИНСКИЕ НАУКИ

MEDICAL SCIENCES

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THE INTERESTING CASE

Annotation

The patient was a 21 year - old white women.

The patient complained on symptoms and clinical manifestation typical for GERD.

She considered herself to be ill for about four month.

Key words

Damages of microcirculation within esophageal mucosa, psychoanalyst consultations.

Laboratory tests, visual endoscopic data, X - ray examination, 24 - hour Ph - monitoring was normal.

Intraesophageal PH - level decreased to the point less then 4,0 during not more than 5 % of the overall Ph - monitoring time.

At morphological examining the esophageal mucosa there were found damages of microcirculation within esophageal mucosa, spasm of arteriolae, perivascular swelling and fibrin occlusion in arteriolae (Fig 1).

Fig. 1. Spasm of arteriolae, perivascular swelling and fibrin occlusion in arteriolae.

These changes were observed in the minimal affected parts of esophageal mucosa characterized by the absence of epithelium damages.

Medication was not successful.

Complaints and morphological inflammatory changes of esophageal mucosa were the same (as previous).

Later while talking to the patient there were established trustworthy relationships with the patient and she explained that her father had committed suicide by taking the acetic acid.

After two weeks of psychoanalyst consultations the clinical manifestation substantially decreased (felt better) and in one month they completely desappeared.

Medication did not take place at that time.

In four weeks biopsy of esophageal mucosa was repeated. Pathologic changes of esophageal mucosa were not found (Fig. 2) .

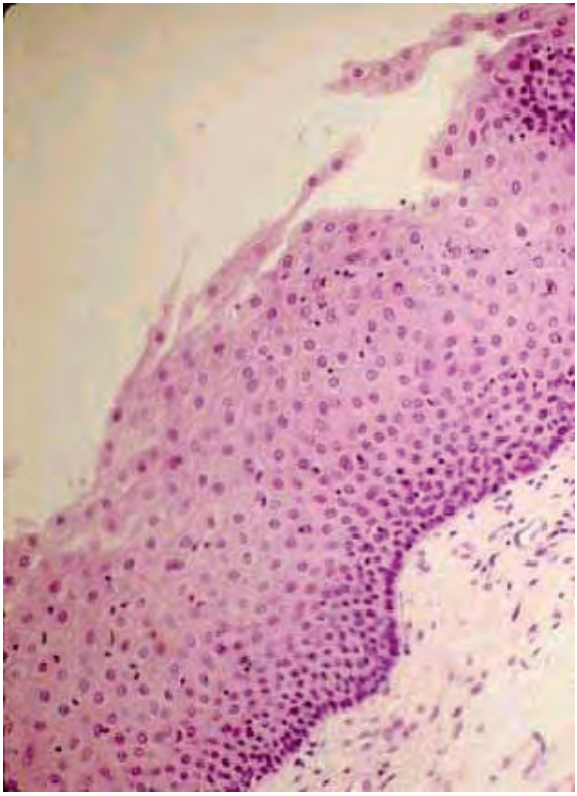

Fig. 2. Pathologic changes of esophageal mucosa were not found

Microcirculation restored to the full extent.

Studying this case is of great practical interest.

ПЕДАГОГИЧЕСКИЕ НАУКИ

PEDAGOGICAL SCIENCES

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ORGANIZATION OF TUTOR SUPPORT FOR PRESCHOOL CHILDREN

Annotation

The article deals with the problem of the organization of tutor activity in a preschool educational institution, its functions, as well as the requirements for the personality of the tutor.

Keywords

Tutor, position, professional role, tutor activity, psychological and pedagogical support, professional and personal development, emotional intelligence.

Tutoring today – the most important element of individualization. That phenomenon which promotes "transformation" of children into the independent, initiative, able to gain independence and take responsibility for the life citizens. When in preschool institution a rich environment in which there is a place for the choice and self - determination is created, the tutor - becomes the mentor forming the orientation field of development for the child. The tutor as the mentor, the expert who relies on the internal potential of the child and leaves behind him the right to make the choice, taking for him direct responsibility. The tutor starts "trigger" of improvement of the person, providing his maintenance, helps to master resources of the social environment for educational, professional and personal development.

Why is it necessary to tutor in kindergarten?

In every preschool, there are intransigent, inattentive, hyperactive or extremely gifted children. Just, the tutor is the specialist who can individualize the educational process in accordance with the features, needs and capabilities of the ward. He organizes the process so that the child learns the program adopted in kindergarten, without disrupting the development of other children.

Tjutorism appears where there is a need to individualize educational programs. A tutor is a specialist who teaches ward to cope with difficulties on their own and advises parents (and teachers) in relation to a particular child.

Unlike the teacher, the computer works purposefully with one child.

During educational activities, the tutor:

 monitors the organization of the child's work space;

 correlates the tasks of the teacher with the capabilities of the child;

 If the general task for all children is difficult to understand the child, then he continues to work with the mentee on a simplified task.

For the child himself, inclusion should be a process that promotes his development, including raising the level of speech and communication skills, socialization skills and intellectual level. It is the sphere of socialization that should become the main goal for the development of the child in a preschool institution.

But in order for inclusion and learning among regulatory peers to succeed, special children require specialized assistance. This requires the inclusion of a tutor in the educational process in an inclusive group of a preschool institution.

Denoting the tasks of the tutor, we highlight the following: accompanying the child in his usual environment (giving her developmental properties); Creating conditions for education in a particular system; formation of new competencies; overcoming Functions of the tutor in the DOE:

1. Organization of educational environment for preschoolers:

 designing an open, variable educational environment (for example, the environment created by Maria Montessori is the closest and most successful example of a tutor course);

 Increasing the availability of educational resources for children to develop individual educational routes and projects;

 Designing a special educational environment for preschoolers with HIA and disability;

 Coordination of the interaction of educational actors.

2. Organizational and methodological support for preschool children:

 selection of methodological means for children to create individual educational routes and projects;

 Methodical provision of interaction between educational subjects in order to individualize the educational process;

 selection and development of methodological tools for analysis of results of tutor support.

3. Pedagogical support of individual educational routes of preschoolers:

 identification of individual characteristics, interests, abilities, problems, difficulties of pupils;

 Involving the child in the development of his / her individual educational routes and projects;

 support of children in the implementation of routes;

 selection and adaptation of pedagogical means of individualization;

 pedagogical support for the reflection of preschoolers;

 Organization of parental participation in the development of individual educational routes, projects of the child.development deficits; Building partnerships with the child's family and teachers.

List of literature:

1. Krylova N.B., Tutor - a new type of teacher in the conditions of individualization of education / N. B. Krylova // Management of a modern school. Head teacher. – 2009. – № 5. – Page 61 - 70.

2. https: // academy - prof.ru / blog / tyutorstvo - v - detskom - sadu

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PROJECT METHOD OF TEACHING A FOREIGN LANGUAGE

Abstract

This work is devoted to the problem of interactive teaching of a foreign language. The author considers the basic principles and methods of interactive learning at different stages of language

learning. The importance of design technology as an effective means of learning a foreign language has been substantiated.

Keywords

Interactive learning, project method, competence.

Nowadays teachers of foreign languages at non - linguistic faculties face the problem of high - quality education of a specialist who speaks a foreign language in accordance with the requirements of the curriculum and a limited academic period [1,2]. During the educational process, it's been found out that students of non - linguistic specialties experience great difficulties in communicating in a foreign language, do not know the language base, do not have elementary knowledge of grammar, and do not have the simplest vocabulary. It is advisable to activate the educational - speech activity of students at the motivational - incentive and orientational - research stages, since it is here that difficulties arise that prevent speech actions [3, 4]. These difficulties are manifested in the following: students are not sufficiently motivated to carry out speech utterances; they are often poorly versed in the topic on which it is necessary to speak; students do not have the skills to master the structure of speech utterance; there is not enough vocabulary to build a speech utterance. It's common knowledge, that the activation of the educational - speech activity of students at the motivational - incentive stage is directly related to the motive of speaking. A person begins to speak when he feels the need for verbal comprehension of the surrounding reality, the need to express his thoughts. In the process of enhancing the educational and speech activity of students at the orientation - research stage, students explore the conditions of educational and speech activity, highlight the main idea (the subject of speaking), attract the necessary language and speech means. Students learn to select and, in the course of educational communication, determine the ways of forming and articulating their own thoughts. It is possible to teach students professional communication of a foreign language in a short time by combining traditional and innovative methods [5, 6]. The study of the features of oral scientific speech is based both on modern data of psychological and methodological science, and on the communicative features of the professional language. Currently, when teaching a foreign language, increased attention is paid to the project method, the most suitable technology for personality - oriented education, which allows to activate pedagogical support, socialization, to include students both in a personality - oriented situation and in various environments. It is also possible to get true practical results in the form of a presentation on regional studies on a computer, a film, a video clip, a presentation, etc., which also highly motivates students. The method of projects can be defined as a purposeful, independent activity of students, carried out under the flexible guidance of a teacher, aimed at solving a research or socially significant pragmatic problem and obtaining a specific result in the form of a material or ideal product. When working with the design methodology, it is assumed that both individual independent work and joint work in small and large groups are used. When teaching foreign languages, students work with various sources of information, widely use research methods, which allows them to express a different vision of the problem under consideration, summarize the collected material and present it in a visual form, formulate their point of view. Depending on the nature of the final product of project activities in the field of foreign language learning, the following types of projects can be distinguished: 1. role projects, in particular, dramatizing an event, acting out a situation, composing your own play; 2.constructive and pragmatic projects, in particular the development of the communication situation, observation diary; 3.information and

research projects, in particular "English as a means of international communication", "The behavior of the British in various situations of communication"; 4.publishing projects, in particular a newspaper note; 5.projects of a specific sociological survey; 6.creative projects, in particular the translation of a work into a native or foreign language; 7.script projects. Working on a project not only allows you to use a foreign language at the level of real communication when discussing the process of working on a project, the results achieved, but also allows you to work out certain aspects of the language, teach speech etiquette.

References:

1. Волкова В.В. Гуманитарные науки в технических ВУЗах // В.В. Волкова // Вестник ВГАВТ, выпуск 45,2015. - С.219 - 221.
2. Волкова В.В. Проблемы развития навыков профессионально ориентированной диалогической речи в технических ВУЗах // Актуальные проблемы гуманитарных и социально - экономических наук. 2018. Т. 12. № 6. –С. 67 - 68.
3. Коваль О.И. Активизация процесса обучения иноязычному общению студентов неязыкового ВУЗа посредством современных технологий преподавания иностранного языка. // Вестник Волжской государственной академии водного транспорта. Выпуск 49. – Нижний Новгород: Изд - во ФБОУ ВПО «ВГАВТ», 2016. – С. 306 - 308.
4. Коваль О.И. Коммуникативный подход при обучении иностранному языку студентов ВУЗа // Вестник Волжской государственной академии водного транспорта. 2014. № 41. С. 144 - 157.
5. Соловьева О.Б. Речевые ситуации в процессе обучения иностранному языку: типизация и структура // Вестник Волжской государственной академии водного транспорта. 2016. № 46. С. 283 - 286.
6. Соловьева О.Б. Характеристика учебно - речевых ситуаций профессионального общения // Вестник Волжской государственной академии водного транспорта. 2016. № 47. С. 258 - 262.

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FORMATION AND DEVELOPMENT OF GENERAL CULTURAL COMPETENCIES IN THE PROCESS OF IMPLEMENTING THE PRINCIPLE OF HOLISTIC AND SYSTEMATIC GENERALIZED ACTIVITY OF TRAINING SPECIALISTS

Annotation

The article presents the formation and development of general cultural competencies in the process of implementing the principle of holistic - system generalized activity in relation to the holistic - system life cycle in the training of specialists.

Key words
General cultural competences, the principle of integral - system generalized activity, integral - system cycle of life activity.

The formation and development of general cultural competencies in the process of implementing the principle of holistic - system generalized activity in relation to the holistic - system cycle of life activity in the training of specialists is determined by the further presentation of educational and professional activities through the improvement of the joint educational - professional holistic - system cycle of life activity. The definition of general cultural competencies is associated with the mathematical modeling of pedagogical functions of the development of subject, economic and social relations [1, p. 64].

The formation and development of general cultural competencies in the process of implementing the principle of integral - system generalized activity in relation to the integral - system cycle of life activity is represented by: the basic - generalized star of the Erzgamma of the hyperspace of life activity (E1); the basic - generalized integral - system cycle of life activity (E2); the basic - generalized star of the Erzgamma of system analysis (E3); the basic - generalized manifestation of the twelve stages and forms of the cognitive hyperspace of life activity regarding the educational process (E4); the basic expression of the twelve stages of holistic - systemic action (E5) [2, p. 226].

The formation and development of general cultural competencies in the process of implementing the principle of integral - system generalized activity performs in phase three of its own comparative functions: orientation, execution and control of the integral - system structure of the educational process.

Each basic and normative global process of formation and development of general cultural competencies in the process of implementing the principle of integral - system generalized activity corresponds to the pedagogometric function - forming the definition of the integral - system form in the organization of the formation and development of general cultural competencies - is associated with the goal: to identify the object of research as a system - the integral system of formation and development of general cultural competencies in the process of implementing the principle of integral - system generalized activity as a measure of a given level of consistency and integrity;

to determine the generating environment – the externally allocated integral system of formation and development of general cultural competencies in the process of implementing the principle of integral - system generalized activity; to establish the integral properties of the integral system of formation and development of general cultural competencies in the process of implementing the principle of integral - system generalized activity; to identify the levels of structure of formation and development of general cultural competencies in the process of implementing the principle of integral - system generalized activity; to determine the structure of the structure of the formation and development of general cultural competencies in the process of implementing the principle of integral - system generalized activity; to establish the structural elements of the formation and development of general cultural competencies in the process of implementing the principle of integral - system generalized activity; to identify the system - forming links within the level of formation and development of general cultural competencies in the process of implementing the principle of integral - system generalized activity; to determine the inter - level relations of the formation and development of general cultural competencies in the process of implementing the

principle of integral - system generalized activity; to establish its own form of formation and development of general cultural competencies in the process of implementing the principle of integral - system generalized activity; to identify the system properties of the formation and development of general cultural competencies in the process of implementing the principle of integral - system generalized activity; to determine the behavior of the formation and development of general cultural competencies in the process of implementing the principle of integral - system generalized activity; to establish a forecast of the development of general cultural competencies in the process of implementing the principle of integral - system generalized activity of training specialists [3, p. 41].

The formation and development of general cultural competencies in the process of implementing the principle of holistic and systemic generalized activity is the basis for professional activity , which assumes new qualitative characteristics associated with the formation of a system type of orientation in both technical and social objects, which are considered from the general system bases, aimed at the unity of the subject and activity bases of the development of holistic and systemic cycles of life activity, establishing the conditions for the development and formation of a holistic and systemic personality.

References

1. Gal'perin P.Ya. Vvedenie v psihologiyu. – M.: Universitet, 2000. – S.336.

2. Mishchik S.A. Razvitie struktury celostno - sistemnogo uchebnogo dejstviya // Materialy Mezhdunarodnoj nauchnoj konferencii «Deyatel'nostnyj podhod k obrazovaniyu v cifrovom obshchestve». Fakul'tet psihologii MGU imeni M. V. Lomonosova, Moskva. 13 - 15 dekabrya 2018 g. – M.: Izdatel'stvo Moskovskogo universiteta, 2018. – S.225 – 227.

3. Reshetova Z.A., Mishchik S.A. Opyt shirokoprofil'noj podgotovki uchashchihsya po radioelektronike. // Shkola i proizvodstvo. – 1984. – № 1 – S. 40 –42.

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FOREIGN LANGUAGE AS A MEANS OF FORMING PROFESSIONAL COMPETENCE OF A TECHNICAL UNIVERSITY STUDENTS

Annotation

The article deals with the problem of teaching a foreign (English) language at a technical university. The author speaks of the need to raise the importance of this discipline in the context of vocational education along with specialized subjects. The subject "Foreign language" in a technical university should be considered as a means of forming professional competence.

Keywords

Professional competence, vocational education, technical university, training of specialists

Features of the socio - economic development of Russia, its new political role in the world cause new requirements for university graduates, requirements that would make it possible to successfully organize professional activities in social, economic, and cultural contexts. There is a need to train international - level specialists, practical knowledge of a foreign language is considered as the leading indicator of a specialist's education, and the foreign language itself is a mandatory component of professional training, a factor in the formation of professional competence. Modern society is interested in competent specialists who are ready to work effectively in multinational teams, specialists who are able to use the world's information resources.

In modern science, the competence - based approach, focused mainly on the value - semantic, content and personal components of education, is considered the most productive for solving the problems of training a specialist. [1] The process of teaching a foreign language at a technical university must be considered in line with the formation of professional competence, therefore, it is obvious that the content of teaching the discipline "Foreign language" and educational material should be more consistent with the profile of the university and meet the requirements of the future profession.

Language training should take an essential place in the process of professional training of water transport specialists, in particular, in the specialty "Technical operation of transport radio equipment". First, knowledge of a foreign language is one of the requirements for certification of radio operators. This is reflected in the regulatory documents:

The International Agreement on Standards for Graduation, Certification and Watchkeeping (STCW) and its 1995 amendments have additional competency requirements for certification candidates that must be met by the GMDSS radio operator. For example, with regard to language skills, STCW requires knowledge of English, both written and spoken "for communication and exchange of information relevant to disaster and safety."

Moreover, along with teaching Maritime English in the light of convention requirements, a foreign language teacher also faces the task of teaching a future specialist to use a foreign language as a means of systematic replenishment of his professional knowledge. As one of the ways to replenish professionally significant knowledge and expand the competence of trainees, we offer holding student conferences in the specialty in English. During the semester, students independently develop individual questions on a given topic, followed by the preparation of a report and presentation at the conference. As a rule, such work is carried out at the final stage of teaching English, when the trainees have already formed a sufficient language base. It should be noted,

Experience shows that this type of work promotes the activation of independent cognitive activity of students, the acquisition of the skill of using unadapted sources to obtain additional information and experience in processing foreign language information in the specialty, the development of cognitive and professional motivation of students.

Thus, proficiency in a foreign language makes it possible to get acquainted with foreign achievements in the field of radio electronics, enriching students with new knowledge and expanding the opportunities for professional growth of a young specialist. The subject "Foreign language" in a technical university should be considered not only as a goal, but also as a means of teaching and, accordingly, the formation of professional competence.

References

1. Zimnyaya I.A. Key competencies as an effective - target basis of a competence - based approach in education. - M., 2004.
2. The concept of modernization of Russian education for the period up to 2010. - M., 2002.
3. Strategy for the modernization of the content of general education. Materials for the development of documents for the renewal of general education. - M., 2001.

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THE USE OF VIDEO MATERIALS IN FOREIGN LANGUAGE LESSONS IN NON - LINGUISTIC UNIVERSITIES AS A PART OF PEDAGOGICAL TECHNOLOGY

Abstract: This article examines the possibilities and pedagogical prospects of using video materials in foreign language classes in non - linguistic universities. The author believes that the use of professional videos will significantly increase interest in language studying. This type of work is considered by the author to be a part of pedagogical technology.

Key words: foreign language, motivation, video, pedagogical technology.

The teacher at each lesson acts as a methodologist, psychologist, teacher and mentor. To achieve success, a teacher needs to have a clear plan, a clear vision of the task at hand. Pedagogical technology is developed for a specific pedagogical concept, which is based on a specific idea of the author. Modern psychologists and educators agree that the quality of the performance of an activity and its result depends on the motivation. Motivation causes purposeful activity, which determines the choice of means and techniques, their ordering to achieve goals. The teacher must imagine the entire arsenal of motivational tools, all types of motivation and reserves. Then it will be possible to accurately correlate the content of the educational process throughout its entire length with the corresponding types of motivation. [1]

The availability of modern digital technical teaching aids, which are so popular among young people, gives the teacher a wide range of tools and opportunities for their use in pedagogical technology. [2]

Let's consider one of them - video materials. Using videos in English lessons is not a new idea. Even in elementary and high school, this type of work is widely used. Undoubtedly, it promotes the popularization of modern forms of education and the development of motivation for students' speech activity. You can use video materials and videos at any stage of the training. Of course, the use of video for beginners is limited and requires additional training, but it can be an interesting addition to the educational process. The teacher should develop a series of exercises before and

after watching, which would make it easier to understand the video material, identify the lexical minimum that needs to be learned. [3, 4]

Fortunately, now you can find a huge number of video courses and films of any orientation in a foreign language, the main thing is to correctly select and process the selected material, taking into account the age and professional characteristics of the students. In order for the process of teaching foreign languages with the help of video materials to be effective, a systematic and rational use of video in the classroom is necessary. You should also determine the place of video lessons in the training system and the frequency of their use.

To the great regret of teachers, the number of classroom hours allocated for the study of a foreign language is reduced annually, more hours are allocated for the student's independent work. Accordingly, the teacher tries to compensate the lack of classroom time with homework, which is often rather monotonous: reading and translating a text, performing written lexical and grammatical exercises, etc. We can't say that is a bad type of training, but a bit old - fashioned. [5, 6]

It is video courses and films (and different in topics) in a foreign language that can return interest and increase student self - learning.

Fortunately, now on the Internet in the free access you can find sites and files popularizing the study of foreign languages, and since the majority of young people are dependent on the Internet, this fact can be used to optimize the educational process, to fulfill the assigned pedagogical task. Of course, viewing should be accompanied by lexical and methodological support from the teacher. The most important thing is that work with video materials can take place independently, and during the lesson, vocabulary, monologue and dialogical speech are practiced. For example, for weak students, you can offer to write an essay on the topic viewed, or to reproduce part of the dialogue in pairs with the use of the lexical minimum suggested by the teacher. Students with good knowledge can try their hand at simultaneous translation or dubbing videos using professional vocabulary.

It can be concluded that, unlike traditional methods, which undoubtedly have a high informative, educational and developmental orientation, video material has an advantage, since it combines all types of speech interaction.

List of references

1. Volkova V.V. Humanities in technical universities // V.V Volkova // Bulletin of the Volga State Academy of Water Transport. 2015. No. 45. p. 219 - 221.

2. Koval O.I. . Cooperation technology and its application in foreign language teaching. // River transport (XXI - century). 2014. - No. 3 (68) - p. 81.

3. Solovyova O.B. Characteristics of educational and speech situations of professional communication // Bulletin of the Volga State Academy of Water Transport. 2016. № 36. p. 258 - 262.

4. Volkova V.V. The process of foreign language teaching in multi - level groups. Bulletin of the Volga State Academy of Water Transport. 2016. No. 47. p. 233 - 235.

5. O.B. Solovyova , Guro - Frolova Yu.R. Interactive methods and techniques in foreign (English) language teaching to future water transport engineers // River transport (XXI century). 2014. No. 1 (66). p. 56 - 59.

6. Koval O.I The problem of choosing the optimal approaches and methods of foreign language teaching. Bulletin of the Volga State Academy of Water Transport. 2015. No. 45. p. 233 - 239.

ФИЛОЛОГИЧЕСКИЕ НАУКИ

PHILOLOGICAL SCIENCES

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THE ANALYSIS OF THE VIEWS ON THE TEXT AND THE ROLE OF PAROEMIAS IN IT

АНАЛИЗ ВЗЛЯДОВ НА ТЕКСТ И МЕСТО В НЕМ ПАРЕМ

Abstract: One of the areas in which language interacts with culture in the text is this precendent. One lives in an infinite duration of previous texts relative to each newly created text. This article provides views on the substitution of parems in the text and comments on the order of application.

Key words: fiction, literary language, speech, text, precedent.

Аннотация: Этот прецедент одна из областей, в которых язык взаимодействует с культурой в тексте. Человек живет в бесконечной продолжительности предыдущих текстов относительно каждого вновь созданного текста. Эта статья дает представление о месте парем в тексте и комментарии к процедуре подачи заявки.

Ключевые слова: художественная литература, концепт, литературный язык, речь, текст, прецедент.

The great literary theorist Roland Bart "identified thirteen parameters for the analysis of the text of a work, among which it was stated that the text is the subject of discourse, not language: 1) the text appears only in the process; 2) the text is a linguistic phenomenon, it falls within the scope of speech; 3) the text is in constant motion and cannot be stable by nature; 4) the text is directed beyond the correct boundaries of speech; 5) if we consider the text as a sign in the concept of Saussure, its meaning is not clear, the text is at the discretion of the speaker; 6) is a plural by definition of the text, this plural is unpredictable because the text is in constant motion; 7) comprehension of the text is always a one - time action (tomorrow or even an hour later the same text can be perceived differently by the same person, which is its abundance and transience); 8) any text as well as context, connects other texts; 9) successful or unsuccessful combination of different patterns and decorative elements of the text; 10) Defining a text receiver - on the one hand, it is like defining the imagination of a traveler who thinks about nature (a jar in the same forest, a pool gives him different impressions on different days), on the other hand, it is a complex multi - stage game plays both the person who perceives the text and the text itself; 11) working with text is based not only on the game and cooperation with it, but also on a more difficult and confusing category – "enjoyment of the text"; 12) the text rejects the idea of a definite structure that the researcher can distinguish and explain in the work, the stable structure is replaced by a living process of continuous formation of meanings; 13) The task of the text researcher is to see the process of continuous formation of meanings and not to try to distinguish the factors that predetermine the appearance of the text [1.p.54].

V.V. Vinogradov explains the inseparable antinomy of the interaction of peoples' languages and cultures to the peculiarities of the language of fiction: [2. p.83] He emphasizes the importance of

relying on reality in reflecting and analyzing reality in literary texts: “The main category in the field of linguistic study of fiction is usually recognized as a concept of individual style (i.e. a specific, historically defined, complex, but structural unit of means and forms). In the writer’s style, according to his artistic design, all the language tools used by the artist are combined, intertwined and aesthetically elegant. At the same time, in the style of individual artistic creation, the elements of the future system of the national literary language are sometimes more vivid and clear, and the functional remnants of the language past are more clearly reflected. In the work of a great writer, the voice of the whole nation is often heard. Due to the complexity of all this, the historical laws of the development of literary style - the development of literature as a broad field of culture and its connection with the development of folk and literary language - have not yet been fully revealed [1.p.58].

The interrelationship of the language of fiction with cultural and historical reality is unquestionably important, I.R. Galperin: “The language of people (of any kind) actually exists in two incarnations: the primary - in the living language, the living language, and the secondary - in the language of artistic, aesthetic use. These two representations of language can be called artistic and literary language, or artistic - figurative language, respectively. It is also important to clearly understand that in a developed system of concepts, the concept of literary - figurative language does not derive from the concept of literary norm at all. Literary - figurative language can be literary standardized, literary non - standard, ancient and written, embodied only in the oral tradition. Indeed, no human tribe can exist without such traditions; but not in the darkness of time, but in the conditions of our modernity, civilization has passed into the present stage of earthly history, and some small peoples with secular and religious legends, fairy tales, and mythological songs containing natural and social knowledge, including self - identification, have survived”[3]. One of the areas in which language interacts with culture in the text is precedent events. “One lives in an infinite continuity of previous texts relative to each newly created text”. M.M. Bakhtin wrote, "Our vital practical speech is full of other people's words: with some we unite our voices and forget someone's words, with others we amplify our words, consider them honorable for us, and ultimately we live on our planet with aspirations" [4.p.87] Initially, the term “precedent” was used to refer to a person belonging to a particular language.

Yu.N. Karaulov first used the term “precedent” when talking about events that were important to a particular person. Events are "(1) so - called important for a particular person's cognitive and emotional response. (2) for a well - known person, that is, well - known to a person’s past and contemporaries, and (3) repeated references to that person’s discussion." In the future, the word “precedent” spread to a specific language community: it was the name of an event that was recognized and identified by members of the language community. Frequent use of the precedent phenomenon leads to its conceptualization: it becomes a sign that is identified by all members of this language community. This situation brings the name and the text of the work closer to the concept, but does not equate them: the concept can be expressed as an abstract noun, a group of synonymous words, or the name of the work or text. Previous names and texts are not a concept, but can be the basis of a concept or one of the options for expressing them. Accordingly, concepts can be based on usage conditions or names, or modified depending on the specific usage situation. In expressing a concept, the primary and non - primary representative are distinguished, and previous nouns and texts can play primary and secondary roles. Both conceptualization and the use of preceding nouns and texts are different ways of assimilating and understanding reality, both by a

particular language community and by the language owner. Any situation will not be the same as before, only the features that are repeated several times and are specific to the life practice of a particular language community are precedent. A similar concept reflects an important mental category that embodies the basic features of the worldview.

REFERENCES:

1. Барт Р. S / Z. – пер. Г.К. Косикова – М.: Editorial URSS, 2001. – С. 54 – 55.

2. Виноградов В.В. О языке художественной литературы – М.: Гослитиздат, 1959. – С. 83.

3. Полянин А.В. Вклад И.Р. Гальперина в стилистику английского языка // Научное сообщество студентов: МЕЖДИСЦИПЛИНАРНЫЕ ИССЛЕДОВАНИЯ: сб. ст. по мат. XXXIV междунар. студ. науч. - практ. конф. № 23(34). URL: https: // sibac.info / archive / meghdis / 23(34).pdf

4. Бахтин М.М. Эстетика словесного творчества. – М.: Наука, 1975. – С. 67.

ФАРМАЦЕВТИЧЕСКИЕ НАУКИ

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REGIONAL FEATURES OF IMPLEMENTATION OF RARE DISEASES POLICY IN THE RUSSIAN FEDERATION

Abstract

Currently, there are between 5,000 and 8,000 rare diseases all over the world. Individuals with rare diseases require a wide range of medicinal products, for most of which a distinctive feature is the high cost associated with high costs of development and production of medicinal products, while at the same time low sales volumes due to the small size of the target population. In the Russian Federation, in accordance with Federal Law No. 323 - FZ of November 21, 2011, drug provision of citizens suffering from life - threatening and chronic progressive rare diseases is carried out in accordance with the approved at the federal level list of rare diseases out of budget resources of the subjects of Russian Federation. The purpose of the study was to study the features of the implementation of preferential medicine provision for patients with rare diseases in various subjects of the Russian Federation in 2018 - 2019. A study was carried out with the use of specially developed request maps sent to the health authorities of the subjects of the Russian Federation. The data was analyzed for 21 subjects of the Russian Federation. For purpose of this analysis, we used the methods of comparative, structural, logical, retrospective analyzes. Statistical processing of the results was performed using the Statistica for Windows software package (Release 10.0, StatSoft Inc.) and MS Excel for Windows software. The total amount of financing for preferential medicine provision for patients with rare diseases in the subjects of the Russian Federation, for which data were provided by the health authorities, amounted to 6.4 billion rubles in 2018 and 6.1 billion rubles in 2019, the median (interquartile range) of funding in the studied subjects of the Russian Federation amounted to 198.4 million rubles (111.4 - 408.8 million rubles in 2018 and 151.9 million rubles (99.1 - 408.1 million rubles) in 2019. The indicator of the average appealability of patients with rare diseases for medical care was 62.2 % at the end of 2018 and 63.1 % at the end of 2019. To improve the efficiency of the drug supply system for patients with orphan diseases, the issues of state regulation of reducing the cost of purchasing expensive orphan drugs, as well as the possibility of attracting funds from the federal budget, are considered.

Key words

Rare diseases, preferential medicine provision program, subjects of Russian Federation

Currently, there are between 5,000 and 8,000 rare diseases all over the world [1]. Rare diseases are identified as a priority field for public health action [2]. According to statistics, in the absence of

proper treatment, death for 10 % of patients occurs before the age of 5 years, for 12 % - at the age of 5 to 15 years. About 50 % of rare diseases lead to disability [1, 3].

In different countries there are adopted criteria for classifying diseases as rare. In the Unites States disease is considered rare if it affects fewer than 200,000 individuals, in some countries definition is based on prevalence rates [4]. In the Russian Federation, in accordance with Part 1 of Art. 44 of the Federal Law of November 21, 2011 No. 323 - FZ "On the Basics of Health Protection of Citizens in the Russian Federation" (as amended to July 31, 2020), rare (orphan) diseases include diseases with a prevalence of no more than 10 cases per 100 thousand population. So far the list of rare (orphan) diseases includes more than 250 nosologies [5].

Individuals with rare diseases require a wide range of medicinal products, for most of which a distinctive feature is the high cost associated with high costs of development and production of medicinal products, while at the same time low sales volumes due to the small size of the target population [1, 6, 7].

In the Russian Federation, in accordance with Federal Law No. 323 - FZ of November 21, 2011, medicine provision of citizens suffering from life - threatening and chronic progressive rare diseases is carried out in accordance with the approved at the federal level list of rare diseases out of budget resources of the subjects of Russian Federation. Medicinal products for treatment of rare diseased are provided only to persons included in the Federal Register of Persons Suffering from Life - Threatening and Chronic Progressive Rare (Orphan) Diseases Leading to a Reduced Life Expectancy of Citizens or Their Disability. In 2017 medicines for the amount of 16.2 billion rubles were dispensed for persons suffering from orphan diseases, while the deficit amounted to about 6.1 billion rubles [7].

At the same time, there is a high inter - territorial differentiation in the availability of drugs provided within the framework of regional programs of preferential medicine provision. For example, in 2017 in some constituent entities of the Russian Federation expenses for the purchase of medicines for the treatment of rare diseases for 10 thousand people amounted to more than 1.5 million rubles, and in others - less than 300 thousand rubles [8].

In this regard, the **purpose** of the study was to study the features of the implementation of preferential drug provision for patients with rare diseases in various subjects of the Russian Federation in 2018 - 2019.

A study was carried out with the use of specially developed request maps sent to the health authorities of the subjects of the Russian Federation. The data was analyzed for 21 subjects of the Russian Federation.

The research program included a comparative assessment:

- the total amount of funding in the analyzed subjects of the Russian Federation (including funds additionally allocated from the federal budget)
- the total amount of costs for medicinal products issued to beneficiaries;
- indicator of the medical care appealability of beneficiaries (for the appointment of medicinal products within support programs for patients with rare diseases);
- the amount of funding per patient in the Federal Register;
- actual costs for one beneficiary who applied.

For purpose of this analysis, we used the methods of comparative, structural, logical, retrospective analyzes. Statistical processing of the results was performed using the Statistica for Windows software package (Release 10.0, StatSoft Inc.) and MS Excel for Windows software.

Descriptive statistics in the text are presented as mean ± standard deviation (M ± SD) for a normal distribution of a trait, or median and interquartile range for an abnormal distribution of a trait. To determine the nature of the distribution of the obtained data, the Kolmogorov - Smirnov test with the Lilliefors correction and the Shapiro - Vilk test were used.

At the end of 2019, out of budget of the subjects of the Russian Federation there were directed 6.4 billion rubles for medicine provision of citizens with rare diseases with available data on the amount of funding (a total of 14 subjects), which is 12.2 % of the total funding for the regional programs of preferential medicine provision.

The maximum amounts of funding allocated from regional budgets for medicine provision of patients with orphan diseases (over 1 billion rubles) were noted in the cities of federal significance Moscow and St. Petersburg. The median amount of funding (interquartile range) in the subjects of the Russian Federation in 2018 amounted to 198.4 million rubles (111.4 - 408.8 million rubles), in 2019 the corresponding value was 151.9 million rubles (99.1 - 408.1 million rubles), which is 23.4 % lower than the value of the indicator in 2018. At the same time, there is a significant variation in the change in the amount of funding in 2019 relative to 2018 in different subjects of the Russian Federation (from - 63.0 % to + 122.5 %).

The medians of the share of funding in the total amount of regional programs of preferential medicine provision amounted to 23.7 % in 2018 and 17.9 % in 2019, while in 2018 in some subjects of the Russian Federation the share of total funding exceeded 40 % .

The median (interquartile range) of medicine costs amounted to 150.9 (82.8 - 357.1) million rubles in 2018 and 136.4 (72.4 - 302.3) million rubles in 2019.

The median values of funding for one patient from this group in 2018 amounted to 1.223 million rubles, in 2019 - 973.6 thousand rubles (decrease by 7 %). It was found that the value of the analyzed indicator in the subjects of the Russian Federation is significantly different. For example, the minimum values of the amount of funding per 1 patient with rare diseases amounted to 247.6 thousand rubles (Republic of Tatarstan) in 2018 and 681.69 thousand rubles (Tula region) in 2019. The maximum values of the amount of funding allocated for preferential medicine provision per patient in the registry, were noted in the Sakhalin region and the Republic of Sakha / Yakutia (over 2 million rubles).

At the end of 2019, 63.1 % (median) of the total number of persons included in the register applied for medicines, the corresponding value in 2018 was 62.2 % . In the Chelyabinsk region, all citizens included in the register of persons suffering from rare diseases applied for medicines at the expense of the regional budget. The second position in terms of the indicator "Medical care appealability of beneficiaries with rare diseases within the framework of regional programs of preferential medicine provision" is the city of federal significance Moscow (89.4 % and 86.0 % in 2018 and 2019, respectively).

The median values (interquartile range) of the indicator “Average volume of actual costs per year per one applied beneficiary” amounted to 2.5 million rubles. (1.54 - 3.77 million rubles) in 2018 and 1.73 million rubles. (1.55 - 3.39 million rubles) in 2019. There was a significant variation of this indicator in the analyzed subjects of the Russian Federation.

Thus, the total amount of financing for preferential medicine provision for patients with rare diseases, the average appealability of patients with rare diseases for medical care, the average volume of financing per year per 1 patient in the registry and average volume of actual costs per year per one beneficiary who applied were determined for 21 subjects of the Russian Federation.

As shown by the analysis, the share of the cost of purchasing medicines for patients with rare diseases of the total funding for regional programs of preferential medicine provision ranged from 6.2 % to 49.7 % in 2018 and from 6.7 % to 34.9 % in 2019. In most constituent entities of the Russian Federation, the average amount of funding per year for 1 patient with rare diseases exceeded 500 thousand rubles, and the volume of actual costs per one applied patient it exceeded 1 million rubles. This trend is due to two main factors: differences in the structure of the cohort of patients with rare diseases, as well as different financial capabilities of regional budgets [6, 8]. For example, high costs per patient in the Republic of Sakha (Yakutia) are due to the provision of medicines in this subject of the Russian Federation for the most expensive nosologies, in particular mucopolysaccharidosis type II [6]. Provision of medicines for patients with life - threatening and chronic progressive rare diseases in most cases is a difficult task for the constituent entities of the Russian Federation [1, 8, 9]. In some cases, the constituent entities of the Russian Federation purchase medicines from the budgets of the next year [7. 9]. In addition, one of the possible problems is the underestimation of the actual number of patients with orphan diseases, as well as drug provision of citizens with orphan diseases, which were not included in the list of high - cost nosologies, or in the list of life - threatening and chronic progressive diseases [6, 8]. To improve the efficiency of the drug supply system for patients with orphan diseases, issues of state regulation of reducing the cost of purchasing expensive orphan drugs, as well as the possibility of attracting funds from the federal budget, are considered.

References

1. Prozherina Y., Shirokova I. Rare but very dangerous // Remedium. 2016. No 5. P. 26 - 31. DOI: http: // dx.doi.org / 10.21518 / 1561 - 5936 - 2016 - 5 - 26 - 31. (In Russ.)
2. Transposition and implementation of EU rare disease policy in Eastern Europe / Pejcic A. V. [et al.] // Expert Review of Pharmacoeconomics & Outcomes Research. 2017. Vol. 17. No 6. P. 557 - 566, DOI: 10.1080 / 14737167.2017.1388741.
3. Kosiakova N.V. The medico - social aspects of patients with orphan diseases // The Journal of scientific articles “Health and Education Millennium”. 2018. Vol. 20. No 2. P. 50 - 53. http: // dx.doi.org / 10.26787 / nydha - 2226 - 7425 - 2018 - 20 - 2 (In Russ.).
4. Review of 11 national policies for rare diseases in the context of key patient needs / Dharssi S. [et al.] // Orphanet J Rare Dis. 2017. Vol. 31, No. 12(1). P. 63. doi: 10.1186 / s13023 - 017 - 0618 - 0.
5. List of rare (orphan) diseases from November 5, 2020. Available at: https: // minzdrav.gov.ru / documents / 8048 - perechen - redkih - orfannyh - zabolevaniy (accessed March 17, 2021). (In Russ.)
6. Analysis of amount and volume of financing patients with orphan diseases in the Russian Federation / Sura M.V. [et al.] // Meditsinskie tekhnologii. Otsenka i vybor. 2014. No 3. P. 43 - 90. (In Russ.).
7. Analytical review “Russian pharmaceutical market. Results of 2018" / DSM Group, 2018. Available at: https: // dsm.ru / docs / analytics / Annual _ report _ 2018 _ DSM.pdf (accessed March 17, 2021). (In Russ.).
8. Assessment of necessary financial expenses on the drug supply of the patients with orphan diseases in the Russian Federation / Sura M.V. [et al.] // Farmakoekonomika. Modern Pharmacoeconomic and Pharmacoepidemiology. 2014. Vol. 7, No 3. P. 36 - 43. (In Russ.)

9. Avksentev N.A., Nazarov V.S. Provision of pharmaceuticals in Russia: current situation and prospects for the future // Russian economic development. 2019. Vol. 26, No 11. P. 63 - 67. (In Russ.)

ТЕХНИЧЕСКИЕ НАУКИ

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INTEGRATION OF SCIENCE AND EDUCATION IN THE TRAINING OF PERSONNEL FOR THE AGRICULTURAL SECTOR OF THE ECONOMY

Annotation

The article presents the general concept of the formation and development of the scientific and pedagogical school of St. Petersburg " Efficient use of Energy, intensification of electrotechnological processes ". The main research topics and the integration of research results with the system of training the young generation of scientists in the master's and postgraduate programs of SPbGAU are presented.

Keywords

Scientific and pedagogical school, electrical technologies, energy efficiency.

The scientific school " Efficient use of Energy, intensification of electrotechnological processes "[1] is based on the development and implementation of fundamental and applied scientific research. contributing to an increase in the volume of competitive import - substituting products with minimal energy costs [2, 3, 4, 5, 6, 7, 8, 9]. A feature of the scientific school is the systematic implementation of the function of the initiator of scientific ideas, the introduction of innovations in the production activities of enterprises of the agro - industrial complex. Scientists of the scientific school are united not only by the research topics, but also by the traditions passed on to the new generation.

The research topic takes into account the specifics of the development of the agricultural sector of the economy, in which energy is not produced. In this regard, the main criterion for optimizing the energy efficiency of enterprises is the energy intensity of their products. At the same time, the technological line of processing industries is considered as an energy line from the power source to the processed material object (product, raw materials, etc.).

The concept of the scientific school and the results of research are the basis for the formation of master's and postgraduate programs of the energy profile on the basis of SPbGAU. The author's disciplines are shown in Figure 1.

Figure 1. Author's disciplines

The research topics are shown in Figure 2.

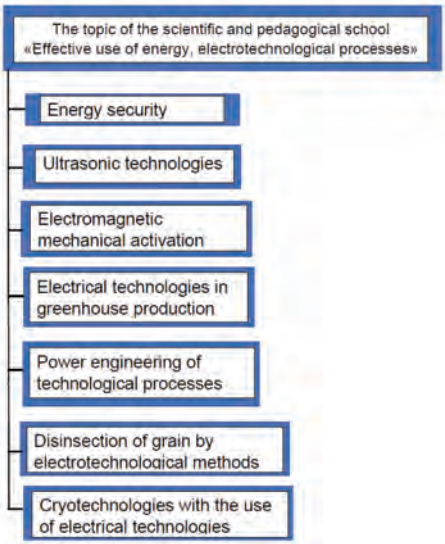

Figure 2. Research topics

The scientific school is formed at the intersection of scientific disciplines in the form of solving an interdisciplinary problem - reducing the energy intensity of finished products [10].

References

1. Bezzubtseva M.M The priorities of the educational activities at training of electrotechnical profile agroengineer // European Scientific Conference. 2017. - pp. 222 - 224.
2. Bezzubceva M.M., Volkov V.S., Krishtopa N.Yu., Mastepanenko M.A., Gabrielyan Sh. Zh. Theoretical Studies of the Method of Electromagnetic Mechanical Activation // The Challenge of Sustainability in Agricultural Systems. - Berlin: Springer, 2021. - pp. 929 - 939.
3. Bezzubceva M.M., Volkov V.S Intensification of processes of products storage using methods of electrotechnology // International Journal of Applied and Fundamental Research. - 2016. - №2. - pp. 17.
4. Bezzubceva M.M. Theoretical researches of working process electromagnetically mechanoactivations of the product in the magnetoliquefied layer ferrotel // European Journal of Natural History. - 2017. - №2. - pp. 10 - 12.
5. Bezzubtseva M., Volkov V., Romanov A., Mukhametshin I. On the problem of calculation of electromagnetic fields in electromechanical dispersants of cylindrical structures // The scientific heritage. - 2019. - №40. - pp. 14 - 17.
6. Bezzubtseva M.M, Volkov V.S., Phambu Ch.S. Energy of the process of mixing materials in electromagnetic mixers // International Conference "Process Management and Scientific Developments". - Birmingham: Scientific publishing house Infinity, 2020. - pp. 82 - 87.
7. Bezzubceva M.M., Volkov V.S. A study of the power contacts in magnetic liquefied layer of ferro - impurities in the coolant in the working volume of electromagnetic densitometers (EPL) // European Journal of Natural History. - 2016. - №4. - pp. 55 - 59.
8. Bezzubceva M.M. Assessment of electromagnetic energy mechanical activators // International Journal of Applied and Fundamental Research. - 2016. - №2. - P. 18.
9. Bezzubceva M.M., Volkov V.S. To question the design of the model series electromagnetic mechanoactivation // International Journal of Applied and Fundamental Research. - 2016. - №3. - P. 3.
10. Marina Bezzubceva, Vladimir Volkov, Sergei Gulin, Alexander Pirkin and Christopher Fambu Systematic approach to the analysis of the operation on power technological production lines of agricultural enterprises // E3S Web of Conferences 210. EDP Science, 2020. - P. 08002.

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CONSIDERATION OF THE SOLUTION OF ONE OF THE PROBLEMS OF HEAT TRANSFER USING THE METHOD OF DIMENSIONS

Annotation

The main task of the work is to solve the stationary problem of heat transfer in a horizontal heat exchanger with an exhaust shaft. Show the advantage of the dimension method in a particular case.

And also to study the influence of the heat load and the geometrical dimensions of the heat exchanger on the heat exchange process and to find the dependence in the form of a formula.

Keywords

Heat transfer, dimension method, dimensionless quantities

In cases where the processes under study are not described by differential equations, one of the ways to analyze them is an experiment, the results of which are most expediently presented in a generalized form (in the form of dimensionless complexes). The method of composing such complexes is the method of dimension analysis.

The dimension of a physical quantity is determined by the relation between it and those physical quantities that are taken as the main (primary) ones. Each system of units has its own basic units. For example, in the International System of Units of Measurement SI, the units of measurement of length, mass and time are taken as meter (m), kilogram (kg), second (s), respectively. The units of measurement of other physical quantities, the so - called derived quantities (secondary), are taken on the basis of the laws establishing the relationship between these units. This relationship can be represented as a so - called dimension formula.

The main difficulty in studying thermal phenomena using the method of dimension analysis is related to the need to discuss the question of the most convenient dimension formulas for quantities, the units of which are taken as the main ones.

As you know, the heat transfer process is characterized by a heat transfer coefficient, which depends on a variety of parameters:

$$\alpha = y[\nu^a, c^b, \rho^c, \lambda^d, d^b, h^k, l^f, (g\beta\theta)^g]$$

The heat transfer intensity is characterized by a dimensionless Nusselt number:

$$Nu = \frac{\alpha l}{\lambda}$$

where: λ - coefficient of thermal conductivity, l - length of the heat exchange tube.

Let's choose 4 basic dimensions: kg, m, s, K. The dimensions of all other quantities are expressed in terms of the selected ones:

$$кг\,c^{-3}K^{-1} = y[(м^2c^{-1})^a, (м^2c^{-2}K^{-1})^b, (кг\,м^{-3})^c, (кг\,м\,c^{-3}K^{-1})^d, м^k, м^b, м^f, (м\,c^{-2})^g]$$

Compare the coefficients and substitute them into the original equation:

$$кг: 1 = c + d$$

$$м: 0 = 2a + 2b - 3c + d + e + f + g + k$$

$$c: -3 = -a - 2b - 3d - 2g$$

$$K: -1 = -b - d$$

$$c = 1 - d$$

$$b = 1 - d$$

$$e = 3c - 2a - 2b - d - f - g - k = 3 - 3d - 2a - 2 + 2d - d - f - g - k =$$

$$= 1 - 2d - 2a - f - g - k = 1 - 2d - 2 + 2d + 4g - g - f - k = -1 + 3g - f - k$$

$$a = 3 - 2b - 3d - 2g = 3 - 2 + 2d - 3d - 2g = 1 - d - 2g$$

$$\alpha = y[\nu^{1-d-2g}, c^{1-d}, \rho^{1-d}, \lambda^d, d^{-1+3g-f-k}, h^k, l^f, (g\beta\theta)^g]$$

$$\frac{\alpha d}{\nu c \rho} = \frac{\alpha l}{\lambda}\frac{\lambda}{c\mu} = \left[\left(\frac{\lambda}{\nu c \rho}\right)^d, \left(\frac{l}{d}\right)^f, \left(\frac{h}{d}\right)^k, \left(\frac{g\beta\theta d^3}{\nu^2}\right)^g\right]$$

$$Nu\,\mathrm{Pr}^{-1} = \left[(\mathrm{Pr})^{-d}, \left(\frac{l}{d}\right)^f, \left(\frac{h}{d}\right)^k, (Gr)^g\right]$$

$$Nu = \left[(\mathrm{Pr})^{1-d}, \left(\frac{l}{d}\right)^{f}, \left(\frac{h}{d}\right)^{k}, (Gr)^{g} \right]$$

finally we get

$$Nu = \left[(\mathrm{Pr})^{b}, (Gr)^{g}, \left(\frac{l}{d}\right)^{f}, \left(\frac{h}{d}\right)^{k} \right]$$

As a result of the physical experiments on heat transfer, results were obtained that were reduced to similarity numbers or dimensionless quantities. Using the least squares approximation of the curves, the relationship between these similarity numbers was found. The results of the study were processed in dimensionless quantities [1, p. 9]. The dependence of the average Nusselt number on the Rayleigh number, the length of the heat exchange pipe, its internal diameter and the height of the exhaust shaft is established. This dependence is generalized by the following formula:

$$Nu = 0{,}015 Ra^{0{,}25} \left(\frac{l}{d}\right)^{0{,}6} \left(\frac{d}{h}\right)^{0{,}1}$$

where: Ra=PrGr.

As we can see, a physical model of the heat transfer process was obtained using the method of dimensions. The functional dependences of the heat transfer coefficient on the input power and on the geometric dimensions of the heat exchanger were obtained. The analysis of the obtained results was generalized in the form of a dimensionless equation expressing the relationship of thermophysical and hydrodynamic quantities.

References

1. Мильман О. О., Канарейкин А. И. Исследование теплообмена в области ламинарного течения при естественной циркуляции в горизонтальном теплообменнике с вытяжной шахтой // Вестник Калужского университета. 2008. №3. С. 9 - 11.

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OPTICAL PROPERTIES OF Cu_2NiSnS_4 THIN FILMS SYNTHESIZED BY SPRAY PYROLYSIS TECHNIQUE

Annotation

Spray pyrolysis was used to obtain thin films of Cu_2NiSnS_4 compound. The transmission spectra of films in region of intrinsic absorption edge at a temperature of 300 K are investigated. The band gap of indicated semiconductor compound is determined.

Keywords

Thin films, spray pyrolysis, transmission spectra, band gap

Modern achievements in physics and technology of semiconductors are largely determined by search and detailed study of new semiconductor materials. Such materials include multicomponent compounds of type I_2 - II - IV - VI_4 (where I = Cu, Ag; II = Zn, Cd, Mn, Fe, Co; IV = Si, Ge, Sn; VI = S, Se, Te). This is due to the fact that these materials are direct - gap and have a high optical absorption coefficient (> 10^4 cm^{-1}). The band gap of a number of these compounds varies in the range 1.1–1.6 eV, which is optimal value for creating solar cells [1–3].

This paper presents results of measuring and analyzing transmission spectra in the region of intrinsic absorption edge, determining the band gap of Cu_2NiSnS_4 thin films.

By pyrolytic decomposition of a mixture of salts with concentrations of 0.1M – $CuCl_2 \times 2H_2O$, 0.1M – $NiCl_2 \times 6H_2O$, 0.1M – $SnCl_4 \times 5H_2O$, and 0.1M – $(NH_2)_2CS$, thin films of the p - type Cu_2NiSnS_4 compound with a thickness of ~ 1 μm were obtained. The ratio of the components that formed the films in the [Cu] : [Ni] : [Sn] : [S] = 2 : 1 : 1 : 10 solution was provided by the corresponding calculation of the molar masses of the chemical reagents involved in the formation of the film on the substrate surface. A significant increase in $(NH_2)_2CS$ is associated both with the high volatility of sulfur and with the peculiarity of the properties of the solutions themselves, in which insoluble metal complexes are formed with an insufficient amount of thiourea. In order to avoid formation of finely dispersed insoluble complexes, primarily metal hydroxides, an appropriate sequence of mixing starting components was used.

The pyrolysis process took place taking into account following chemical reactions:

$2Cu_2^+ + Sn_2^+ \rightarrow 2Cu^+ + Sn_4^+$

$Cu^+ + Cl^- \rightarrow CuCl \downarrow$

$CuCl + 2(NH_2)_2CS \rightarrow [Cu((NH_2)_2CS)_2]Cl$

$Ni_2^+ + 2(NH_2)_2CS + 3Cl^- \rightarrow [Ni((NH_2)_2CS)_2]Cl_3$

$Sn_4^+ + 2(NH_2)_2CS + 4Cl^- \rightarrow [Sn((NH_2)_2CS)_2]Cl_4$

$[Cu((NH_2)_2CS)_2]Cl + [Ni((NH_2)_2CS)_2]Cl_3 + [Sn((NH_2)_2CS)_2]Cl_4 \rightarrow Cu_2NiSnS_4$

The measurement of transmission and absorption spectra in the region of fundamental absorption edge was carried out on Cary - 500 spectrophotometer at temperature of 300 K. The spectra were recorded relative to air in the range 200–3000 nm with a step of 2 nm.

The transmission spectrum (T) of Cu_2NiSnS_4 compound is shown in fig. 1.

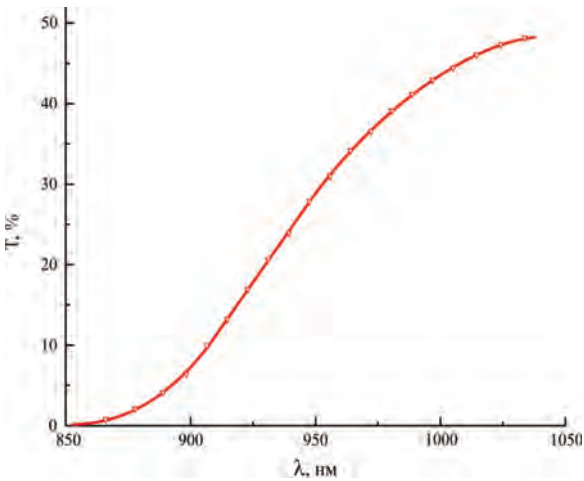

Figure 1 – Transmission spectrum of Cu_2NiSnS_4 compound

From the Bardeen relation for determining absorption edge, absorption coefficient (α) is related to the energy ($h\nu$) of photons incident on it as follows:

$(\alpha h\nu)^n = A(h\nu - E_g)$

The optical band gap was determined by plotting dependence of value $(\alpha h\nu)^n$ on the incident photon energy ($h\nu$) with the subsequent projection of tangent to plotted graph on the abscissa axis.

Figure 2 shows the spectral dependence of $(\alpha h\nu)^2$ on the photon energy ($h\nu$) for the obtained compound Cu_2NiSnS_4.

The obtained value of optical band gap is 1.32±0.01 eV and is in good agreement with the previously reported values of band gap for Cu_2NiSnS_4 [4–8]. The results showed that the substrate temperature affects optical properties of Cu_2NiSnS_4 thin films. The optical band gap of thin film deposited at 673 K is close to optimal for solar cells.

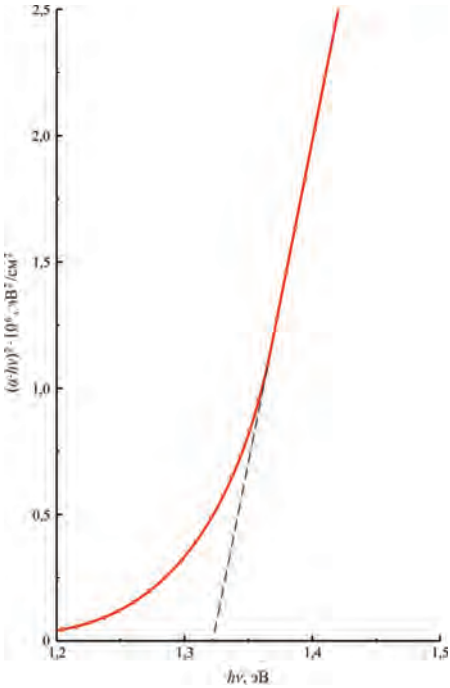

Figure 2 – Spectral dependence of $(\alpha h\nu)^2$ on photon energy $h\nu$ for the obtained compound Cu_2NiSnS_4

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References

1. Gao F., Yamazoe S., Maeda T. et al. / Jap. J. Appl. Phys. 2012. Vol. 51. P. 28.

2. Salome P.M.P., Malaquias J., Fernandes P.A. et al. / Sol. Energy Mater. Sol. Cells. 2012. Vol. 101. P. 147–153.

3. Colombara D., Delsante S., Borzone G. et al. / J. Cryst. Growth. 2013. Vol. 364. P. 101–110.
4. Kamble A. / Materials Letters. 2014. Vol. 137. P. 440–443.
5. Cui Yong. / J. Mater. Chem., 2012. Vol. 22. P. 23136–23140.
6. Ozel F. / Applied Catalysis B: Environmental. 2016. Vol. 198. P. 67–73.
7. Sarilmaz A. / Journal of Alloys and Compounds. 2019. Vol. 780. P. 518–522.
8. Dridi S., Bitri N., Abaab M. / Materials Letters. 2017. Vol. 204. P. 61–64.

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ELECTROMAGNETIC SHIELDS BASED ON Cu_2FeSnS_4 COMPOUND AND STUDY OF THEIR CHARACTERISTICS

Annotation
The frequency dependences of attenuation and reflection coefficient for thin films of the Cu_2FeSnS_4 compound are obtained when interacting with microwave radiation. It was found that semiconductor films of specified compound provide attenuation of electromagnetic radiation between 5 to 13 dB in the frequency range 8...12 GHz.
Keywords
thin films, attenuation, reflection coefficient, microwave radiation

Recently, the issue of creating materials that simultaneously possessed magnetic and semiconducting properties has become increasingly important. All known properties have one or another susceptibility in external magnetic fields. The introduction of transition elements with unfilled 3d shells into individual semiconductors leads to appearance of new and rather unique physical properties of these materials, which combine semiconducting and magnetic properties.

The development of microwave radio electronics, radar devices and expansion of the functional and tactical and technical capabilities of electronic means, special equipment make it relevant to create and use new materials that have new properties.

A new direction in the creation of effective radio - absorbing coatings is the creation, using technological methods, of an array of SRR - rings.

Creation of structures of electromagnetic radiation shields

To create screens of electromagnetic radiation, glass substrates were used, on which molybdenum with a thickness of 0.5 μm was deposited by magnetron sputtering, and then films of the Cu_2FeSnS_4 (CFSS) compound with a thickness of 1 μm were formed by pyrolytic

decomposition of metal salts. In some cases, aluminum foil was used on the back of the glass substrate, which was glued with polyvinyl acetate.

The resulting screen designs had following structure:

1 – CFSS / Mo / glass;

2 – CFSS(g.i.) / Mo / glass;

3 – CFSS / Mo / glass / Al;

4 – CFSS(g.i.) / Mo / glass / Al

To determine contribution to the screening characteristics of films, the Cu_2FeSnS_4 compounds were formed by geometric inhomogeneities (g.i.) in the form of ordered circles with a diameter of 1 mm.

Experimental technique

To study shielding characteristics of the created samples of EMP shields, panoramic voltage standing wave ratio (VSWR) and attenuation meters were used.

The panoramic VSWR and attenuation meter works on the principle of separate separation and direct detection of incident and reflected wave levels. A signal proportional to power incident on the load is generated by a directional incident wave detector. The reflected signal from the load under test is picked up by a directional reflected wave detector and used to determine the VSWR. The studies were carried out in panoramic mode for measuring VSWR and attenuation. The instruments were calibrated in the entire operating frequency range according to the standard method after setting the frequency swing range and incident power level. When measuring in the frequency range of 8...12 GHz, the sample was clamped between the flanges of the waveguides, this method with a small sample thickness was taken to be equivalent to the use of a measuring cell.

The screening efficiency of the investigated samples is characterized by the attenuation of EMP energy and the reflection coefficients of electromagnetic waves by screen.

Shielding characteristics

The electromagnetic properties were evaluated based on characteristics of attenuation and reflection in the range of 8...12 GHz. Figure 1 shows the frequency dependence of EMP attenuation of the resulting screen designs.

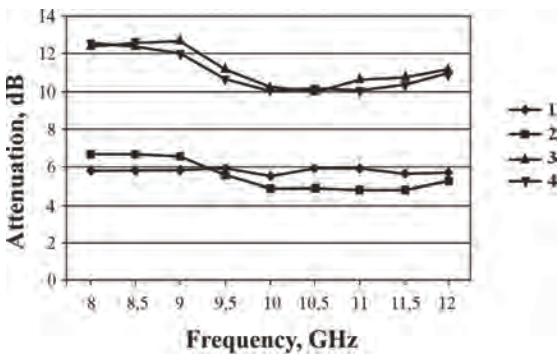

Figure 1 – Frequency response of attenuation by screen materials
(1 - CFSS / Mo / glass; 2 - CFSS(g.i.) / Mo / glass; 3 - CFSS / Mo / glass / Al;
4 - CFSS(g.i.) / Mo / glass / Al) in the range of 8...12 GHz

Figure 1 shows that greatest attenuation is typical for samples based on the structures CFSS / Mo / glass / Al and CFSS(g.i.) / Mo / glass / Al, which is 11...13 dB. Attenuation of EMP by samples based on CFSS / Mo / glass and CFSS(g.i.) / Mo / glass structures is about 5...7 dB.

The following are the results of a study of the reflective properties of screen structures when interacting with radiation in the frequency range of 8...12 GHz (Fig. 2).

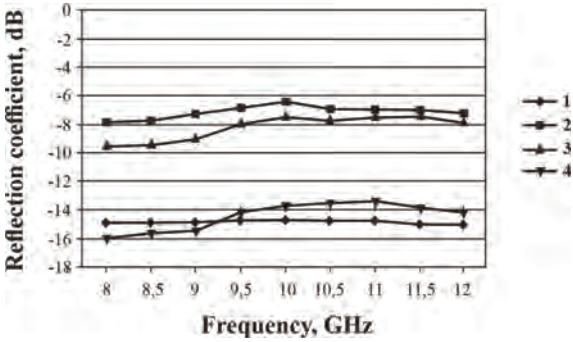

Figure 2 – Frequency response of the reflectance of screen materials
(1 - CFSS / Mo / glass / Al; 2 - CFSS(g.i.) / Mo / glass / Al; 3 - CFSS / Mo / glass;
4 - CFSS(g.i.) / Mo / glass) in the range of 8...12 GHz

The EMP reflection coefficient for the samples under study is −7...−16 dB. The smallest reflection is typical for samples with the CFSS / Mo / glass / Al and CFSS(g.i.) / Mo / glass / Al structure, which is about −13...−15 dB. The reflectance for samples with the CFSS / Mo / glass and CFSS(g.i.) / Mo / glass structure is about −7...−10 dB.

Analysis of characteristics of attenuation and reflection shows that all presented structures have shielding properties in the investigated frequency range, which is determined by the values of EMP attenuation.

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ANALYSIS OF REDUCED VIBRATION IN GEARED MECHANISMS

Abstract: The article provides an analysis of gear mechanisms and dynamic calculations to substantiate design models and determine the parameters of gear drives.

Key words: technique, technology, gear mechanisms, vibration, vibrations, dynamic model of gear transmission, friction, error.

The development of technology and technology lead to an increase in technical processes with an increase in the types, sizes and speeds of modern machines. In engineering calculations, it is becoming more and more important to solve problems associated with vibrations. We know that only on the basis of the theory of vibrations can such theoretical and practically important problems as balancing machines, torsional vibrations of shafts and gears, and others be fully clarified. With the help of this theory, it is possible to establish the most successful proportions of structures, moving the operating conditions of the machines as far as possible from the conditions for the occurrence of large fluctuations [1].

It is known that gear mechanisms are transmission mechanisms containing at least one gear teeth, they are also called gear drives. Therefore, gear drives are designed to transmit torque to driven shafts. Gear mechanisms, which are an integral part of the drive, are more economical to manufacture, reliable in operation, have small overall dimensions and high efficiency in comparison with other mechanisms.

In fact, vibrations in gears lead to an increase in the level of contact and bending stresses in the teeth of the wheels, as well as to fatigue breakage of shafts. With increased compliance of the rims of the gear wheels, bending vibrations may occur in them, leading to fatigue breakdown of the rims and the failure of the entire transmission.

The accuracy of the dynamic calculation of gears is determined by the adopted model of the dynamic system and its parameters. The very procedure for the dynamic calculation of gears after obtaining a system of differential equations describing their dynamic state does not differ from the analytical and numerical methods for calculating elastic systems developed in the theory of oscillations. Therefore, the main attention in the dynamic calculations of gears should be paid to the reasonable choice of design models and the determination of the parameters of gears.

The choice of the calculated dynamic model of the gear transmission cannot be made unambiguously, it largely depends on the purpose of the dynamic calculation being performed. Therefore, one should strive to obtain such a dynamic model, with the help of which it is possible to obtain an answer to the question posed with the required accuracy. An example to analyze the fundamentals of gear modeling in COMSOL Multiphysics (Figure).

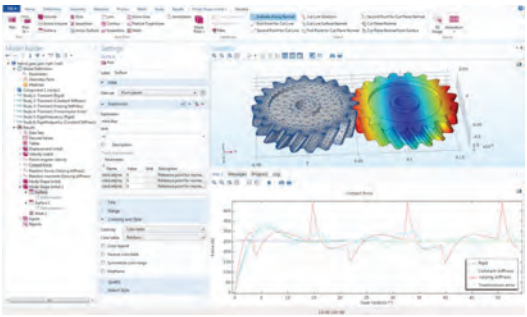

Figure. An example to analyze the fundamentals of gear modeling in COMSOL Multiphysics.

For example, the basic types of dynamic gear model they can connect to each other and be of different sizes. There are three main uses for gears:

Increase speed: Let's say that the first gear has more teeth on the input gear than the output gear. In this case, the second gear should rotate faster than the first. This will reduce the torque on the output element while maintaining the same power in both gears.

Increase in torque: in this case, assume that the input element has fewer teeth than the output element. Then the second gear will rotate slower than the first. The torque will increase.

Changing the direction of rotation: Consider an external gearing. In it, the second element will always rotate in the opposite direction. If the input gear rotates clockwise, the output gear rotates counterclockwise. There are also special gears that allow the transmission of torque at different angles.

In general, gear trains can be viewed as the simplest machines that can reduce torque or gain strength in tooth ratios. A complex gear mechanism or transmission refers to two or more gears working in mesh. The term toothed rack refers to a linear bar with teeth cut on it. When the rack mechanism operates, the rotational motion of the standard gear is transferred to the translational motion of the linear rack.

Ideally, a pair of gears is completely rigid with no friction, no gear error and no circumferential clearance. To simulate a more realistic device, you can add a series of sub nodes with to set the following conditions and effects:

Gear Resilience: Determines the properties of the gearing (for example, the stiffness of the teeth)

Gearing error: Specifies the static gearing error that can result from geometric errors or changes

Circumferential clearance: Determines the clearance in the gears, which affects the transmission dynamics with or without load.

Friction: Taking into account the frictional forces that arise at the point of contact

The current focus is on doing a lot of research to improve gear life. The main issues are the installation of flexible elements on the gears, that is, the reduction of vibration and long - term operation due to the use of rubber materials [2].

REFERENCES

1. Джураев А.Д., Тухтакузиев А., Абдувахобов Д.А. Определение максимальной амплитуды колебаний звена зубчато - колебательного рабочего органа бороны для обработки почвы // Молодежь и XXI век - 2017: материалы VII международной молодежной научной конференции. – Россия, Курск. – 2017. – С. 264 - 267.

2. Abduvakhobov D.A., Muhamedov J., Umurzaqov A. Layout diagram of the hinged oscillatory spike - tooth harrow and determination of its row - spacing width // European Science Review. – Austria, 2016. – N 5. – pp. 175 - 176.

ЭКОНОМИЧЕСКИЕ НАУКИ

ECONOMIC SCIENCES

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DIFFERENT APPROACHES TO DETERMINING COMPETITIVENESS

Annotation

Competitiveness is a multifaceted concept for which until now there is no generally accepted definition. International experience shows that the economy competitiveness assessment consists of a number of components that are in dynamic equilibrium and complement each other. Each state, claiming a certain position in the world economy and politics, must have its own development strategy, within the framework of which the competitive advantages that it possesses are calculated, as well as the disadvantages that hinder the growth process are assessed.

Key words: competition, competitiveness, traditional approach, macroeconomic approach, innovation.

Competition (from the Latin *concurrere* - to collide) is defined as the struggle of independent economic entities for limited economic resources. Accordingly, competitiveness is the ability of a subject to outperform a competitor in the current competitive environment. This concept can be used to characterize the activities of participants in economic relations at the micro - , meso - and macro levels.

In the process of forming a general understanding of the concept of competition and competitiveness, it developed, supplemented and structured. It started by the founder of the classical school Adam Smith and his views on the problems of specialization and division of labor, then there was a neoclassical approach from the standpoint of investing in fixed assets and infrastructure, and, more recently, an ever - increasing concentration on such mechanisms as education, technological progress, macroeconomic stability, management, modernization, innovation.

Recently, the study of the competitiveness of countries has become increasingly important, which is reflected in the growing number of works of foreign and domestic researchers on this issue and in the active participation in its research of international organizations such as the World Economic Forum (WEF), the Institute for Management Development (IMD), Organization for Economic Co - operation and Development (OECD), World Bank (WB), etc. However, despite the significant volume of publications, there is no unambiguous interpretation of the concept of "competitiveness", just as there is no unified approach to its characterization and study, there are different points of view on its nature and content.

The standard (traditional) approach to the problem links the competitiveness of the economy with the cost structure and, thus, with the evolution of its real exchange rate, justifying the success of states in certain industries using the factors of production - land, labor and natural resources [5, p. 8 - 10]. As a result, some countries are indeed making progress in precisely those industries where factors that are abundant are intensive.

The macroeconomic approach defines competitiveness as the ability of the country's economy to quickly adapt to the changing conditions of the global environment, which is expressed in such indicators as the state of the balance of payments, the volume of government debt, the state budget deficit, exchange rate fluctuations, etc. Thus, the reasons for the decline in the country's competitiveness are explained by incorrect economic policies or unfavorable economic conditions in world markets. Within the framework of this approach, the "state" approach is highlighted, expressed in the fact that the country's competitiveness is ensured, first of all, by the government's policy, especially in the field of regulation of the foreign economic sphere [1].

The considered theoretical approaches to the characteristics of the competitiveness of countries have one thing in common: each has one key aspect that determines the level of competitiveness. Thus, proposals to improve the competitiveness of the economy within the framework of each of the approaches are characterized by a narrow focus. However, the experience of countries that have achieved a high level of competitiveness shows that they achieve it in different ways. Therefore, a comparison of the national economies effectiveness only on the basis of any one factor (or a group of factors) is far from satisfactory, and such uncertainty in the interpretation of the concept and nature of competitiveness creates significant difficulties for an adequate understanding of the problem and the correct formulation of tasks related to increasing the country's competitiveness.

In the modern world economy, technological innovations that determine the rates of economic growth and the dynamics of the economic power of states have become the main instrument of competition. As a consequence, there is a classification of the concept of "innovation". Innovation are [4]: 1) investment in the economy, providing a change in technology and technology (in a sense, this characterizes modernization); 2) new technique, technology, which is the achievement of scientific and technological progress.

In relation to innovation, the development of a country can take place in different ways. The term "top" path to competitiveness was first used in the annual report of the United Nations Industrial Development Organization (UNIDO) for 2002, which discussed the threat of a widening gap in the levels of industrial development and competitiveness of developed and developing countries [3]. To mitigate this situation, the international community needs to promote the movement of developing economies along the "upper" path - the path to economic growth through the development of the latest world technologies, the development of scientific research, experimental design (R&D) and innovation. This strategy is opposed to the most common "bottom" path - the path of countries entering the world industrial markets by attracting foreign investors at the cost of providing them with cheap labor and natural resources. These terms clearly capture the essence of the economic choices faced by most countries with world average per capita income. The application of these methods has various consequences for economies.

The main characteristics of the two paths to international competitiveness are the path that brings higher economic returns and creates the basis for sustainable economic growth, and the path that threatens economic impasse. These characteristics are a kind of poles between which all the variety of real economic situations and the possibilities of countries' economic policies fit. The boundaries make it possible to better understand how important for any country the choice of state policy (active or passive) in relation to the creation and maintenance of its own innovative potential. The basis of the "upper" path to is an innovative economy focused on the development of new products of increased consumer and market value, which is not only technically complex, but also well protected by laws. The "upper" path of development is typical for developed economies, for those

that are based on knowledge. Developing countries, unable to compete with the most developed countries in terms of technology, are trying to compete by increasing investments in increasing production volumes and reducing costs, increasing the extraction of natural resources, and lowering wages. In other words, the “lower” path is based on attracting foreign investors at the cost of providing them with cheap labor and natural resources. This leads to an outflow of capital, "brain drain" and instability of economies, "impoverishing economic growth," that is, to a gradual decrease in economic returns even against the background of growth in their export volumes, industrial production, and employment.

To characterize the state of the economy of a country following the “downward” path, whose growth is based on the export of natural resources, the term “Dutch disease”, which was observed in the 70s in the Netherlands after the development of gas fields in the North Sea, is now also used. According to a narrow definition, this disease consists in the deindustrialization of the economy, and its mechanism is an increase in the national currency of the country due to an increase in income and an improvement in the trade balance, which makes the products of manufacturing industries less competitive. Despite the fact that upon the discovery and development of any deposit of raw materials, the country receives a significant amount of natural rent, an increase in per capita indicators of gross domestic product (GDP) and real incomes of the population, there are a number of negative consequences of such growth, namely: high income differentiation and social inequality; regional imbalance in demand and supply of products; high structural unemployment and lower wages for many categories of employees, especially in knowledge - intensive industries with high qualifications; growth in structural inflation; the threat of a structural and monetary and financial crisis (in the event of depletion of a natural resource deposit or a decrease in demand for them); overall strong structural, regional and macroeconomic imbalances in the economy [6].

In relation to innovation, a country can take three positions: actively participate in the creation of new knowledge and conduct research and development (R&D), actively borrow and adapt scientific results obtained by someone else, or perceive technological advances as they naturally spread, that is, without making an effort. In accordance with the chosen position in relation to innovation, there are several strategies for the innovative development of the state: the strategy of scientific and technical leadership; dynamic catch - up strategy (technology adaptation strategy), oligopolistic strategy or competition for investment [2].

From the concept of “persistent” and “non - persistent” competitive advantages point of view [2], it is knowledge - intensive industries that require large long - term investments for constant updating of technological processes, because the competitive advantages formed in a knowledge - intensive industry are more “persistent”. According to this theory, countries seeking to improve the structure of the national economy in order to increase their share in total world income are more promising to invest additional resources in industries where there is a higher likelihood of maintaining competitive advantages over poorer countries with relatively low labor costs.

References

1. Panteleev A. V. Political dimension of the competitiveness of the Russian Federation in the globalizing world. Abstract of thesis. ... dis. Cand. polit. Sciences: 23.00.04; MSTU them. N.E. Bauman. - M., 2010. - 27 p.

2. Ray A. Competitive strategies of the state and firms in export - oriented development // Economic Issues. - 2014. - No. 8. - S.46 - 65.

3. Subbotina T. Russia at a crossroads: two paths to international competitiveness. // Economic Issues. - 2016. - No. 2. - pp. 46 - 64.

4. Fakhrutdinov M.R. The role of innovations in the economic development of the country. / NOU VPO "Academy of Management" TISBI " - Access mode: / [http: // www.tisbi.org / science / vestnik / 2010 / issue3 / Econom / FahrutdinovM.html 18 / 03 / 2020]

5. Gilles Walter. Competitiveness: A General Approach. / Russian - European Center for Economic Policy. - Access mode: [http: // www.recep.ru / files / documents / General _ approach _ competitiveness - Walter - ru.pdf 14 / 02 / 2020]

6. Fetisov G. "Dutch disease" in Russia: macroeconomic and structural aspects // Problems of Economics. - No. 12. - 2016.S. 38 - 53.

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