

**ҚОРАҚАЛПОҒИСТОНДА
ФАН ВА ТАЪЛИМ**

**ҚАРАҚАЛПАҚСТАНДА
ИЛИМ ҲӘМ ТӘЛИМ**

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SOME PROPERTIES OF GEOMETRIC TRIPOTENTS

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Summary: In this work, the properties of geometric tripotents were investigated and it was shown that the sets of complete geometric tripotents and unitary geometric tripotents coincide.

Key words: strongly facially symmetric space, symmetric face, geometric tripotent.

In 1989 Friedman and Russo published their papers [1, 2], where they introduced facially symmetric spaces, the main purpose of the introduction was the geometric characterisation of predual spaces of JB^* -triples admitting an algebraic structure. Many properties required in these characterizations are natural assumptions for state spaces of physical systems. These spaces are considered as a geometric model for states in quantum mechanics. It was proved that the predual space of a complex von Neumann algebra and more general of a JB^* -triples is a neutral strongly facially symmetric space (see [3]). Neal and Russo [4] found geometric conditions under which a facially symmetric space is isometric to the predual space of a complex JBW^* triple. In [5], a complete description of strongly facially symmetric spaces that are isometrically isomorphic to the predual space of an atomic commutative von Neumann algebra was obtained. In [6], it was proved that the predual space of a JBW -algebra is a strongly facially symmetric space if and only if the algebra is the direct sum of an Abelian algebra and an algebra of type I_2 . In [7, 8], a necessary and sufficient condition was found when the elements of the dual space of a reflexive SFS-space are geometric tripotents.

In this work, the properties of geometric tripotents were studied and it was shown that the sets of complete geometric tripotents and unitary geometric tripotents coincide.

Let Z be a real or complex normed space. We say that elements $f, g \in Z$ are orthogonal and write $f \diamond g$ if $\|f + g\| = \|f - g\| = \|f\| + \|g\|$. A face F of the unit ball $Z_1 = \{f \in Z : \|f\| \leq 1\}$ is said to be norm exposed if $F = F_u = \{f \in Z_1 : u(f) = 1\}$ for some $u \in Z^*$ with $\|u\| = 1$. An element $u \in Z^*$ is called a projective unit if $\|u\| = 1$ and $u(g) = 0$ for all $g \in F_u^\diamond$ (see [1]).

A norm exposed face F_u in Z is called a symmetric face if there exists a linear isometry S_u from Z to Z such that $S_u^2 = I$ whose fixed point set coincides with the topological direct sum of the closure $\overline{sp F_u}$ of the linear hull of the face F_u and its orthogonal complement $F_u^\diamond$, i.e., with $(\overline{sp F_u}) \oplus F_u^\diamond$.

A normed space Z is strongly facially symmetric (SFS) if,

1) each norm exposed face in Z_1 is symmetric;

2) for each norm exposed face F_u of Z and each $y \in Z^*$ satisfying the conditions $\|y\|=1$ and $F_u \subset F_y$, we have $S_u^* y = y$, where S_u is the symmetry corresponding to F_u .

For each symmetric face F_u , contractive projections $P_k(u)$, $k = 0, 1, 2$, on Z are defined as follows. First, $P_1(u) = (I - S_u)/2$ is the projection onto the eigenspace corresponding to the eigenvalue -1 of the symmetry S_u . Next, $P_2(u)$ and $P_0(u)$ are defined as projections of Z onto $\overline{sp F_u}$ and $F_u^\diamond$, respectively. The projections $P_k(u)$ are called the geometric Peirce projections. A projective unit u from Z^* is called a geometric tripotent if F_u is a symmetric face and $S_u^* u = u$ for the symmetry S_u corresponding to F_u . By GU and SF we denote the sets of all geometric tripotents and symmetric faces, respectively; the correspondence $GU \ni u \mapsto F_u \in SF$ is one-to-one (see [2, Proposition 1.6]). We set $U = Z^*$, $Z_k(u) = P_k(u)Z$, $U_k(u) = P_k(u)^* Z^*$, $k = 0, 1, 2$.

A contractive projection Q on Z is said to be neutral if $\|Qf\| = \|f\|$ implies $Qf = f$ for each $f \in Z$. A space Z is said to be neutral if, for each symmetric face F_u , the projection $P_2(u)$ corresponding to the symmetry S_u is neutral.

In a neutral strongly facially symmetric space Z , each nonzero element admits a polar decomposition [2, Theorem 4.3], that is, for $0 \neq f \in Z$, there exists a unique geometric tripotent $v = v_f$ for which $v(f) = \|f\|$ and $\langle v, f^\diamond \rangle = 0$. The set of geometric tripotents is ordered as follows: for $u, v \in GU$ we set $u \leq v$ if $F_u \subset F_v$.

A geometric tripotent u is called

- 1) minimal, if $\dim U_2(u) = 1$;
- 2) indecomposable, if for $v \in GU$, $v \leq u$ implies $v = u$;
- 3) maximum, if $U_0(u) = \{0\}$;
- 4) complete, if $U_2(u) = U$;

5) unitary if the convex hull of the set $F_u \cup F_{-u}$ coincides with the unit ball Z_1 , i.e. $Z_1 = \text{co}(F_u \cup F_{-u})$.

In [9], it was proven that in a real finite-dimensional neutral SFS space every indecomposable geometric tripotent is minimal. In [10] it was shown that in a reflexive SFS space of rank 1, every indecomposable geometric tripotent is minimal.

Proposition 1. *Let Z be a neutral strongly facially symmetric space and $\alpha \in \square$, $|\alpha| = 1$.*

- 1) *If $u \in I$, then $\alpha u \in I$.*

2) If $u \in M$, then $\alpha u \in M$.

3) If u is a maximal geometric tripotent, then αu is a maximal geometric tripotent.

4) If u is a complete geometric tripotent, then αu is a complete geometric tripotent.

5) If u is a unitary geometric tripotent, then αu is a unitary geometric tripotent.

Proof. 1) Let $u \in I$ and $\alpha \in \square$, $|\alpha|=1$. Then by [11, Lemma 3.5] it follows that αu is a geometric tripotent. Now we will show the indecomposability of geometric tripotents αu . Let us assume that $\alpha u \notin I$, i.e. there is a geometric tripotent v such that $v \leq \alpha u$. Then according to [11, Proposition 3.6] we have $\bar{\alpha}v \leq u$. Since u is indecomposable, it follows that $\bar{\alpha}v = u$. Therefore, $v = \alpha u$. This means that αu is an indecomposable geometric tripotent.

2) Let $u \in M$ and $\alpha \in \square$, $|\alpha|=1$. Then by [11, Lemma 3.5] it follows that αu is a geometric tripotent and $F_{\alpha u} = \alpha F_u$. Therefore,

$$Z_2(\alpha u) = \overline{sp}F_{\alpha u} = \overline{sp}\alpha F_u = \overline{sp}F_u = Z_2(u).$$

Thus, $U_2(\alpha u) = U_2(u)$. Hence, $\dim U_2(\alpha u) = 1$, i.e. $\alpha u \in M$ for all $\alpha \in \square$, $|\alpha|=1$.

3) Let u be a maximal geometric tripotent and $\alpha \in \square$, $|\alpha|=1$. Then by [11, Lemma 3.5] it follows that αu is a geometric tripotent and $F_{\alpha u} = \alpha F_u$. Therefore, by [11, Lemma 3.5] we have $F_{\alpha u}^\diamond = \alpha F_u^\diamond = 0$, i.e. αu is a maximal geometric tripotent.

4) Let u be a complete geometric tripotent and $\alpha \in \square$, $|\alpha|=1$. Then by [11, Lemma 3.5] it follows that αu is a geometric tripotent and $F_{\alpha u} = \alpha F_u$. So,

$$Z_2(\alpha u) = \overline{sp}F_{\alpha u} = \overline{sp}\alpha F_u = \overline{sp}F_u = Z_2(u) = Z,$$

i.e. αu is a complete geometric tripotent.

5) Let u be a unitary geometric tripotent and $\alpha \in \square$, $|\alpha|=1$. Then by [11, Lemma 3.5] it follows that αu is a geometric tripotent and $F_{\alpha u} = \alpha F_u$. Hence,

$$\text{co}(F_{\alpha u} \cup F_{-\alpha u}) = \text{co}(\alpha F_u \cup \alpha F_{-u}) = \alpha \text{co}(F_u \cup F_{-u}) = \alpha Z_1 = Z_1,$$

i.e. αu is a unitary geometric tripotent. The proof is complete.

Proposition 2. Let Z be a neutral strongly facially symmetric space and u be a complete geometric tripotent in U . Suppose that v is a geometric tripotent in $U_2(u)$ satisfying that $P_2(v)^*u + \frac{1}{2}P_1(v)^*u = u$. Then v is a complete geometric tripotent in U .

Proof. Let v is a geometric tripotent in $U_2(u)$. Then by [2, Proposition 2.1] v is a geometric tripotent in U . Since $P_2(v)^*u + \frac{1}{2}P_1(v)^*u = u$, and by [12, Lemma 1] we have

$$P_2(v)^*u = 2\left(P_2(v)^* + \frac{1}{2}P_1(v)^*\right)^2u - \left(P_2(v)^* + \frac{1}{2}P_1(v)^*\right)u = u,$$

i.e. $u \in U_2(v)$. Therefore, by [11, Proposition 3.3] we have $U_2(u) = U_2(v)$. Then [11, Proposition 3.2] we have $U_0(v) \subset U_0(u)$. Thus $U_0(v) = 0$. Hence, v is a complete geometric tripotent in U . The proof is complete.

A norm exposed face F_u of the unit ball of a normed space Z satisfies the Jordan decomposition property if $(sp_{\square} F_u)_1 \subset co(F_u \cup F_{-u})$. A SFS space satisfies property JD if every symmetric face satisfies the Jordan decomposition property. In this case, we say that Z is locally base normed.

Theorem 3. Let Z be a real locally base normed neutral SFS-space. Then the sets of complete geometric tripotents and unitary geometric tripotents coincide.

Proof. It is known that every unitary geometric tripotent is a complete geometric tripotent. Let's show the opposite. Let u be a complete geometric tripotent. Since Z is a real neutral locally basic normed SFS space, then by [4, Lemma 2.3] we have that

$$(sp_{\square} F_u)_1 \subset co(F_u \cup F_{-u}), \quad (*)$$

On the other hand, u is a complete geometric tripotent, then $(sp_{\square} F_u)_1 = Z_1$. Therefore, from (*) it follows that $Z_1 \subset co(F_u \cup F_{-u})$. Hence, $Z_1 = co(F_u \cup F_{-u})$, i.e. u is a unitary geometric tripotent. The proof is complete.

A geometric tripotent w is finite if any maximal geometric tripotent $u \in U_2(w)$ is already complete in $U_2(w)$.

Theorem 4. Let Z is a real neutral SFS-space with unitary geometric tripotent. Then every geometric tripotent is finite.

Proof. Let v be a unitary geometric tripotent and u is maximal geometric tripotent in $U_2(v)$. Then by [5, Lemma 3.4], there exist mutually orthogonal geometric tripotents $w_1, w_2 \leq v$ such that $u = w_1 - w_2$. Since u is a maximal geometric tripotent, then by [5, Lemma 3.5] we get that $w_1 + w_2$ is a maximal geometric tripotent.

On the other hand, if $w_1, w_2 \leq v$ are mutually orthogonal geometric tripotents, then by [2, Lemma 2.1] we obtain that $F_{w_1}, F_{w_2} \subset F_{w_1+w_2}$, consequently $w_1, w_2 \leq w_1 + w_2$. Since, $L_v = \{\omega \in GU : \omega \leq v\} \cup \{0\}$ is a complete orthomodular lattice (see [2, Proposition 4.5]), then $w_1 + w_2 \leq v$. Thus, by the maximality of $w_1 + w_2$ it follows that $v = w_1 + w_2$.

Let $f \in F_{w_1+w_2}$. Then $\|P_2(w_1 - w_2)f\| \leq \|f\|$ and, by [2, Lemma 4.2] we obtain

$$\begin{aligned} \langle P_2(w_1 - w_2)f, w_1 + w_2 \rangle &= \langle f, P_2(w_1 - w_2)^*(w_1 + w_2) \rangle = \\ &= \langle f, P_2(w_1 - w_2)^*w_1 \rangle + \langle f, P_2(w_1 - w_2)^*w_2 \rangle = \langle f, w_1 + w_2 \rangle = 1. \end{aligned}$$

Consequently, $\|P_2(w_1 - w_2)f\| = \|f\|$ and from the neutrality of space Z we have that $P_2(w_1 - w_2)f = f$. So, $P_2(w_1 - w_2)g = g$ for all $g \in \overline{sp}F_v$. Then $\overline{sp}F_u = Z$, i.e. u is complete in $U_2(v)$. Hence, v is finite geometric tripotent. It is known that (see [11, Lemma 4.2(b)]) if $v \in GU$ is a finite geometric tripotent, then any geometric tripotent in $U_2(v)$ is also finite in U . Then any geometric tripotent finite in U .

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Rezyume: Mazkur maqolada qirralari kuchli simmetrik fazolarda geometrik tripotentlarning xossalari o'rganilib, to'la geometrik tripotentlar va unitat geometrik tripotentlar to'plamlari mos kelishi ko'rsatildi.

Резюме: В данной работе были изучены свойства геометрических трипюментов и показано, что множества полных геометрических трипюментов и унитарных геометрических трипюментов совпадает.

Kalit so'zlar: Qirralari kuchli simmetrik fazo, simmetrik qirra, geometrik tripotent.

Ключевые слова: Сильно гранево симметричное пространство, симметричная грань, геометрический трипюмент.

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FIRST ORDER LINEAR NONHOMOGENEOUS DIFFERENTIAL EQUATIONS WITH IMPULSE EFFECT

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Summary: In the article, three-point boundary value problems for linear nonhomogeneous differential equations of the same order as the pulse are considered.

Keywords: Linear nonhomogeneous differential equation, three-point boundary value problem, impulse effect

In many problems of theoretical physics, quantum electronics, mechanics, rocket and electron engineering, optimal control theory, and other branches of science, the need to learn the usual differential equations for the impulse effect and the boundary problems arose, and many of the ideas explored in the search for the ultimate questions of this theory were explored. To study the fundamental problems of the theory of differential equations, especially those involving rapidly evolving impulse dynamics A.D.Mishkis, A.M.Samoilenko and other great mathematicians dedicated scientific works [2]

This article considers the three-point boundary problems of ordinary linear differential equations with impulse effect and describes the solutions to them.

So let's consider the following differential equation, which is a linear nonhomogeneous equation with impulse effect at only two point

$$\frac{dx}{dt} = px + f(t), t \neq \tau_1, t \neq \tau_2, \quad (1)$$

$$\Delta \Big|_{t=\tau_i} = x(\tau_i + 0) - x(\tau_i - 0) = d_i, \quad i = 1, 2 \quad (2)$$

here p is constant, d_1 and d_2 are given numbers. Let's consider the solution of (1),(2) differential equation with impulse effect which satisfy following three point boundary condition

$$ax(0) + bx(t_1) + cx(T) = d \quad (3)$$

here $a + be^{pt_1} + ce^{pT} \neq 0$ and $\tau_1 < t_1 < \tau_2$.

Let's the solution of (1),(2) differential equation with impulse effect for $t \in [0, \tau_1)$ is $x_1(t)$, for $t \in [\tau_1, \tau_2)$ is $x_2(t)$ and for $t \in [\tau_2, T]$ is $x_3(t)$. Then we know, the solution of (1),(2) differential equation with impulse effect for $t \in [0, \tau_1)$ is defined by

$$x_1(t) = e^{pt} \left(c_1 + \int_0^t e^{-ps} f(s) ds \right) = e^{pt} x_0 + \int_0^t e^{p(t-s)} f(s) ds,$$

for $t \in [\tau_1, \tau_2)$

$$x_2(t) = e^{p(t-\tau_1)} c_2 + \int_{\tau_1}^t e^{p(t-s)} f(s) ds$$

in point $t = \tau_1$ according to condition (2)

$$\Delta \Big|_{t=\tau_1} = x(\tau_1 + 0) - x(\tau_1 - 0) = c_2 - e^{p\tau_1} x_0 - \int_0^{\tau_1} e^{p(\tau_1-s)} f(s) ds = d_1$$

here $x_0 = x(0)$. From this

$$c_2 = d_1 + e^{p\tau_1}x_0 + \int_0^{\tau_1} e^{p(\tau_1-s)}f(s)ds$$

and we take this to solution $x_2(t)$ we obtain

$$x_2(t) = e^{p(t-\tau_1)} \left(d_1 + e^{p\tau_1}x_0 + \int_0^{\tau_1} e^{p(\tau_1-s)}f(s)ds \right) + \int_{\tau_1}^t e^{p(t-s)}f(s)ds$$

or

$$x_2(t) = e^{pt} \left(x_0 + e^{-p\tau_1}d_1 + \int_0^t e^{-ps}f(s)ds \right)$$

So, for $t \in [\tau_2, T]$

$$x_3(t) = e^{p(t-\tau_2)}c_3 + \int_{\tau_2}^t e^{p(t-s)}f(s)ds$$

we need find c_3 , the in point $t = \tau_2$ according to condition (2)

$$\Delta \Big|_{t=\tau_2} = x(\tau_2 + 0) - x(\tau_2 - 0) = c_3 - e^{p\tau_2}x_0 - e^{p(\tau_2-\tau_1)}d_1 - e^{p\tau_2} \int_0^{\tau_2} e^{-ps}f(s)ds = d_2$$

Form this equality we obtain following

$$c_3 = d_2 + e^{p\tau_2}x_0 + e^{p(\tau_2-\tau_1)}d_1 + e^{p\tau_2} \int_0^{\tau_2} e^{-ps}f(s)ds$$

We take this to solution $x_3(t)$

$$x_3(t) = e^{pt} \left(x_0 + e^{-p\tau_1}d_1 + e^{-p\tau_2}d_2 + \int_0^t e^{-ps}f(s)ds \right)$$

As a result, we obtain following general solution in Koshi form of (1),(2) differential equation with impulse effect

$$\text{for } t \in [0, \tau_1) , \quad x_1(t) = e^{pt}x_0 + \int_0^t e^{p(t-s)}f(s)ds;$$

$$\text{for } t \in [\tau_1, \tau_2) , \quad x_2(t) = e^{pt}x_0 + e^{p(t-\tau_1)}d_1 + \int_0^t e^{p(t-s)}f(s)ds; \quad (4)$$

$$\text{for } t \in [\tau_2, T] , \quad x_3(t) = e^{pt}x_0 + e^{p(t-\tau_1)}d_1 + e^{p(t-\tau_2)}d_2 + \int_0^t e^{p(t-s)}f(s)ds$$

If we find the numerical value of the parameter which the boundary condition (3) is satisfied, then we have found the solution of the differential equation (1) - (3) to the impulse function. In this case, we take (4) to (3):

$$\begin{aligned} ax(0) + bx(t_1) + cx(T) &= ax_1(0) + bx_2(t_1) + cx_3(T) = \\ &= ax_0 + be^{pt_1} \left(x_0 + e^{-p\tau_1}d_1 + \int_0^{t_1} e^{-ps}f(s)ds \right) + \end{aligned}$$

$$+ce^{pT}\left(x_0 + e^{-p\tau_1}d_1 + e^{-p\tau_2}d_2 + \int_0^T e^{-ps}f(s)ds\right) = d.$$

From this, entering $Q = a + be^{pt_1} + ce^{pT}$ designation we can find the value of x_0

$$x_0 = \frac{1}{Q}\left[d - be^{p(t_1-\tau_1)}d_1 - ce^{p(T-\tau_1)}d_1 + e^{p(T-\tau_2)}d_2\right] - \frac{b}{Q}\int_0^{t_1} e^{p(t_1-s)}f(s)ds - \frac{c}{Q}\int_0^T e^{p(T-s)}f(s)ds \quad (5)$$

We take value of x_0 to equation (4) for $t \in [0, \tau_1)$

$$x_1(t) = \frac{e^{pt}}{Q}\left[d - be^{p(t_1-\tau_1)}d_1 - ce^{p(T-\tau_1)}d_1 + e^{p(T-\tau_2)}d_2 - b\int_0^{t_1} e^{p(t_1-s)}f(s)ds - c\int_0^T e^{p(T-s)}f(s)ds\right] + \int_0^t e^{p(t-s)}f(s)ds;$$

for $t \in [\tau_1, \tau_2)$

$$x_2(t) = \frac{e^{pt}}{Q}\left[d - be^{p(t_1-\tau_1)}d_1 - ce^{p(T-\tau_1)}d_1 + e^{p(T-\tau_2)}d_2 - b\int_0^{t_1} e^{p(t_1-s)}f(s)ds - c\int_0^T e^{p(T-s)}f(s)ds\right] + e^{p(t-\tau_1)}d_1 + \int_0^t e^{p(t-s)}f(s)ds;$$

for $t \in [\tau_2, T]$

$$x_3(t) = \frac{e^{pt}}{Q}\left[d - be^{p(t_1-\tau_1)}d_1 - ce^{p(T-\tau_1)}d_1 + e^{p(T-\tau_2)}d_2 - b\int_0^{t_1} e^{p(t_1-s)}f(s)ds - c\int_0^T e^{p(T-s)}f(s)ds\right] + e^{p(t-\tau_1)}d_1 + e^{p(t-\tau_2)}d_2 + \int_0^t e^{p(t-s)}f(s)ds;$$

If we use the value of x_0 in equality (5), then we can write this solution form (4) Using $\theta(t)$ function we can write solutions in every interval for $t \in [0, T]$ by following formula

$$x(t) = e^{pt}x_0 + \int_0^t e^{p(t-s)}f(s)ds + \sum_{i=1}^2 \theta(t - \tau_i)e^{p(t-\tau_i)}d_i$$

here the value of x_0 define form formula (5)

So let's think about the following differential equation, which is first order linear nonhomogeneous differential equation with impulse effect at only four points

$$\frac{dx}{dt} = px + f(t), \quad t \neq \tau_i, \quad i = 1, 2, 3, 4, \quad (6)$$

$$\Delta\Big|_{t=\tau_i} = x(\tau_i + 0) - x(\tau_i - 0) = d_i, \quad i = 1, 2, 3, 4 \quad (7)$$

here p is constant, d_1 and d_2 are given numbers. Let's consider the solution of (6),(7) differential equation with impulse effect which satisfy following three point boundary condition (3), here $0 < \tau_1 < \tau_2 < t_1 < \tau_3 < \tau_4 < T$.

If we take into account our previous usage, in this condition the solution of (6),(7) differential equation with impulse effect for $t \in [0, \tau_1)$

$$x_1(t) = e^{pt}x_0 + \int_0^t e^{p(t-s)}f(s)ds;$$

for $t \in [\tau_1, \tau_2)$

$$x_2(t) = e^{pt}x_0 + e^{p(t-\tau_1)}d_1 + \int_0^t e^{p(t-s)}f(s)ds;$$

for $t \in [\tau_2, \tau_3)$

$$x_3(t) = e^{pt}x_0 + e^{p(t-\tau_1)}d_1 + e^{p(t-\tau_2)}d_2 + \int_0^t e^{p(t-s)}f(s)ds;$$

for $t \in [\tau_3, \tau_4)$

$$x_4(t) = e^{pt}x_0 + e^{p(t-\tau_1)}d_1 + e^{p(t-\tau_2)}d_2 + e^{p(t-\tau_3)}d_3 + \int_0^t e^{p(t-s)}f(s)ds$$

and for $t \in [\tau_4, T]$

$$x_5(t) = e^{pt}x_0 + e^{p(t-\tau_1)}d_1 + e^{p(t-\tau_2)}d_2 + e^{p(t-\tau_3)}d_3 + e^{p(t-\tau_4)}d_4 + \int_0^t e^{p(t-s)}f(s)ds$$

boladı. From this we can write following form

$$x(t) = e^{pt}x_0 + \int_0^t e^{p(t-s)}f(s)ds + \sum_{i=1}^4 \theta(t - \tau_i)e^{p(t-\tau_i)}d_i$$

Parameter x_0 defined by using boundary condition (3)

$$\begin{aligned} ax(0) + bx(t_1) + cx(T) &= ax_1(0) + bx_3(t_1) + cx_5(T) = \\ &= ax_0 + be^{pt_1} \left(x_0 + e^{-p\tau_1}d_1 + e^{-p\tau_2}d_2 + \int_0^{t_1} e^{-ps}f(s)ds \right) + \\ &+ ce^{pT} \left(x_0 + e^{-p\tau_1}d_1 + e^{-p\tau_2}d_2 + e^{-p\tau_3}d_3 + e^{-p\tau_4}d_4 + \int_0^T e^{-ps}f(s)ds \right) = d. \end{aligned}$$

From this

$$\begin{aligned} x_0 &= \frac{d - be^{pt_1} e^{-p\tau_1}d_1 + e^{-p\tau_2}d_2 - ce^{pT} e^{-p\tau_1}d_1 + e^{-p\tau_2}d_2 + e^{-p\tau_3}d_3 + e^{-p\tau_4}d_4}{a + be^{pt_1} + ce^{pT}} - \\ &- \frac{b}{a + be^{pt_1} + ce^{pT}} \int_0^{t_1} e^{p(t_1-s)}f(s)ds - \frac{c}{a + be^{pt_1} + ce^{pT}} \int_0^T e^{p(T-s)}f(s)ds \end{aligned}$$

here, using $Q = a + be^{pt_1} + ce^{pT}$ designation we write following form

for $t \in [0, \tau_1)$

$$x_1(t) = \frac{e^{pt}}{Q} \left[d - be^{pt_1} e^{-p\tau_1}d_1 + e^{-p\tau_2}d_2 - ce^{pT} e^{-p\tau_1}d_1 + e^{-p\tau_2}d_2 + e^{-p\tau_3}d_3 + e^{-p\tau_4}d_4 - \right.$$

$$\left. -b \int_0^{t_1} e^{p(t_1-s)} f(s) ds - c \int_0^T e^{p(T-s)} f(s) ds \right] + \int_0^t e^{p(t-s)} f(s) ds;$$

for $t \in [\tau_1, \tau_2)$

$$x_2(t) = \frac{e^{pt}}{Q} \left[d - be^{pt_1} e^{-p\tau_1} d_1 + e^{-p\tau_2} d_2 - ce^{pT} e^{-p\tau_1} d_1 + e^{-p\tau_2} d_2 + e^{-p\tau_3} d_3 + e^{-p\tau_4} d_4 - \right. \\ \left. -b \int_0^{t_1} e^{p(t_1-s)} f(s) ds - c \int_0^T e^{p(T-s)} f(s) ds \right] + e^{p(t-\tau_1)} d_1 + \int_0^t e^{p(t-s)} f(s) ds;$$

for $t \in [\tau_2, \tau_3)$

$$x_3(t) = \frac{e^{pt}}{Q} \left[d - be^{pt_1} e^{-p\tau_1} d_1 + e^{-p\tau_2} d_2 - ce^{pT} e^{-p\tau_1} d_1 + e^{-p\tau_2} d_2 + e^{-p\tau_3} d_3 + e^{-p\tau_4} d_4 - \right. \\ \left. -b \int_0^{t_1} e^{p(t_1-s)} f(s) ds - c \int_0^T e^{p(T-s)} f(s) ds \right] + e^{p(t-\tau_1)} d_1 + e^{p(t-\tau_2)} d_2 + \int_0^t e^{p(t-s)} f(s) ds;$$

for $t \in [\tau_3, \tau_4)$

$$x_3(t) = \frac{e^{pt}}{Q} \left[d - be^{pt_1} e^{-p\tau_1} d_1 + e^{-p\tau_2} d_2 - ce^{pT} e^{-p\tau_1} d_1 + e^{-p\tau_2} d_2 + e^{-p\tau_3} d_3 + e^{-p\tau_4} d_4 - \right. \\ \left. -b \int_0^{t_1} e^{p(t_1-s)} f(s) ds - c \int_0^T e^{p(T-s)} f(s) ds \right] + e^{p(t-\tau_1)} d_1 + e^{p(t-\tau_2)} d_2 + e^{p(t-\tau_3)} d_3 + \int_0^t e^{p(t-s)} f(s) ds;$$

and for $t \in [\tau_4, T]$

$$x_3(t) = \frac{e^{pt}}{Q} \left[d - be^{pt_1} e^{-p\tau_1} d_1 + e^{-p\tau_2} d_2 - ce^{pT} e^{-p\tau_1} d_1 + e^{-p\tau_2} d_2 + e^{-p\tau_3} d_3 + e^{-p\tau_4} d_4 - \right. \\ \left. -b \int_0^{t_1} e^{p(t_1-s)} f(s) ds - c \int_0^T e^{p(T-s)} f(s) ds \right] + e^{p(t-\tau_1)} d_1 + e^{p(t-\tau_2)} d_2 + e^{p(t-\tau_3)} d_3 + \\ + e^{p(t-\tau_4)} d_4 + \int_0^t e^{p(t-s)} f(s) ds;$$

If we use the value of x_0 above, the dín joqaridağı mánisin paydalansaq, using function $\theta(t)$, we can write the solution in every interval for $t \in [0, T]$ by using following formula

$$x(t) = e^{pt} x_0 + \int_0^t e^{p(t-s)} f(s) ds + \sum_{i=1}^4 \theta(t - \tau_i) e^{p(t-\tau_i)} d_i$$

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Rezyume: Maqolada impuls tasirida birinchi tartibli shiziqli bir jinsli emas differentsial tenglamalar uchun uch nuqtali chegaraviy masalalar ko'rib chiqiladi.

Резюме: В статье рассматриваются трехточечные краевые задачи для линейных неоднородных дифференциальных уравнений того же порядка, что и импульс.

Kalit so'zlar: Chiziqli birjinsli emas diferentsial tenglama, uch nuqtali chegaraviy masala, impuls tasir

Ключевые слова: Линейное неоднородное дифференциальное уравнение, трехточечная краевая задача, импульсный эффект

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**FIRST ORDER LINEAR HOMOGENEOUS DIFFERENTIAL EQUATIONS WITH
IMPULSE EFFECT AND THEIR SYSTEMS**

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Summary: In the article, three-point boundary value problems for linear homogeneous differential equations of linear order are considered.

Keywords: Linear homogeneous differential equation, three-point boundary value problem, impulse effect

Currently, the theory of boundary problems is one of the fastest-developing branches of the theory of differential equations, and has been refined by many mathematicians, including M.Naimark [1], A. M. Samoilenko [2, 3] and many others.

In many problems of theoretical physics, quantum electronics, mechanics, rocket and electron engineering, optimal control theory, and other branches of science, the need to learn the usual differential equations for the impulse effect and the boundary problems arose, and many of the ideas explored in the search for the ultimate questions of this theory were explored. To study the fundamental problems of the theory of differential equations, especially those involving rapidly evolving impulse dynamics A.D.Mishkis, A.M.Samoilenko and other great mathematicians dedicated scientific works [2.27]

This article considers the three-point boundary problems of ordinary linear differential equations with impulse effect and describes the solutions to them.

So let's consider the following differential equation, which is a linear equation with impulse effect at only two point

$$\frac{dx}{dt} = px, t \neq \tau_1, t \neq \tau_2, \quad (1)$$

$$\Delta \Big|_{t=\tau_i} = x(\tau_i + 0) - x(\tau_i - 0) = d_i, \quad i = 1, 2 \quad (2)$$

here p is constant, d_1 and d_2 are given numbers. Let's consider the solution of (1),(2) differential equation with impulse effect which satisfy following three point boundary condition

$$ax(0) + bx(t_1) + cx(T) = d \quad (3)$$

here $a + be^{pt_1} + ce^{pT} \neq 0$ and $\tau_1 < t_1 < \tau_2$.

Let's the solution of (1),(2) differential equation with impulse effect for $t \in [0, \tau_1)$ is $x_1(t)$, for $t \in [\tau_1, \tau_2)$ is $x_2(t)$ and for $t \in [\tau_2, T]$ is $x_3(t)$. Then we know, the solution of (1),(2) differential equation with impulse effect for $t \in [0, \tau_1)$ is defined by $x_1(t) = c_1 e^{pt} = x_0 e^{pt}$, and for $t \in [\tau_1, \tau_2)$ is $x_2(t) = c_2 e^{pt}$, point $t = \tau_1$ according to condition (2)

$$\Delta \Big|_{t=\tau_1} = x(\tau_1 + 0) - x(\tau_1 - 0) = (c_2 - x_0) e^{p\tau_1} = d_1$$

equality is appropriate. From this $c_2 = x_0 + e^{-p\tau_1} d_1$, and if we take this to equation $x_2(t) = c_2 e^{pt}$ we obtain following

$$x_2(t) = x_0 + e^{-p\tau_1} d_1 e^{pt}$$

here $x_0 = x(0)$.

So, for $t \in [\tau_2, T]$ from solution $x_3(t) = c_3 e^{pt}$ we need find c_3 , the in point $t = \tau_2$ according to condition (2)

$$\Delta \Big|_{t=\tau_2} = x(\tau_2 + 0) - x(\tau_2 - 0) = c_3 - x_0 - e^{-p\tau_1} d_1 e^{p\tau_2} = d_2$$

from this equality $c_3 = x_0 + e^{-p\tau_1} d_1 + e^{-p\tau_2} d_2$, and if we take this to equation $x_3(t) = c_3 e^{pt}$ we obtain following

$$x_3(t) = x_0 + e^{-p\tau_1} d_1 + e^{-p\tau_2} d_2 e^{pt}$$

As a result, we obtain following general solution in Koshi form of (1),(2) differential equation with impulse effect

$$\text{for } t \in [0, \tau_1) \quad x_1(t) = x_0 e^{pt};$$

$$\text{for } t \in [\tau_1, \tau_2) \quad x_2(t) = x_0 + e^{-p\tau_1} d_1 e^{pt}; \quad (4)$$

$$\text{for } t \in [\tau_2, T] \quad x_3(t) = x_0 + e^{-p\tau_1} d_1 + e^{-p\tau_2} d_2 e^{pt}$$

If we find the numerical value of the parameter which the boundary condition (3) is satisfied, then we have found the solution of the differential equation (1) - (3) to the impulse function. In this case, we take (4) to (3):

$$\begin{aligned} ax(0) + bx(t_1) + cx(T) &= ax_1(0) + bx_2(t_1) + cx_3(T) = \\ &= ax_0 + b x_0 + e^{-p\tau_1} d_1 e^{pt_1} + c x_0 + e^{-p\tau_1} d_1 + e^{-p\tau_2} d_2 e^{pT} = \\ &= a + be^{pt_1} + ce^{pT} x_0 + be^{p(t_1-\tau_1)} d_1 + c e^{p(T-\tau_1)} d_1 + e^{p(T-\tau_2)} d_2 = d. \end{aligned}$$

From this

$$x_0 = \frac{d - be^{p(t_1-\tau_1)} d_1 - c e^{p(T-\tau_1)} d_1 + e^{p(T-\tau_2)} d_2}{a + be^{pt_1} + ce^{pT}}$$

If we take this to (4) we obtain following

$$\text{for } t \in [0, \tau_1) \quad x_1(t) = \frac{d - be^{p(t_1-\tau_1)} d_1 - c e^{p(T-\tau_1)} d_1 + e^{p(T-\tau_2)} d_2}{a + be^{pt_1} + ce^{pT}} e^{pt};$$

$$\text{for } t \in [\tau_1, \tau_2) \quad x_2(t) = \frac{d + ae^{-p\tau_1} d_1 - ce^{p(T-\tau_2)} d_2}{a + be^{pt_1} + ce^{pT}} e^{pt};$$

$$\text{for } t \in [\tau_2, T] \quad x_3(t) = \frac{d + ae^{-p\tau_1} d_1 + ae^{-p\tau_2} d_2 + be^{p(t_1-\tau_2)} d_2}{a + be^{pt_1} + ce^{pT}} e^{pt}$$

So let's think about the following differential equation, which is first order linear homogeneous differential equation with impulse effect at only four points

$$\frac{dx}{dt} = px, \quad t \neq \tau_i, \quad i = 1, 2, 3, 4, \quad (5)$$

$$\Delta \Big|_{t=\tau_i} = x(\tau_i + 0) - x(\tau_i - 0) = d_i, \quad i = 1, 2, 3, 4 \quad (6)$$

here p is constant, d_1 and d_2 are given numbers. Let's consider the solution of (5),(6) differential equation with impulse effect which satisfy following three point boundary condition, here $0 < \tau_1 < \tau_2 < t_1 < \tau_3 < \tau_4 < T$.

If we take into account our previous usage, in this condition the solution of (5),(6) differential equation with impulse effect for $t \in [0, \tau_1)$ is $x_1(t) = c_1 e^{pt} = x_0 e^{pt}$, for $t \in [\tau_1, \tau_2)$ solution is $x_2(t) = x_0 + e^{-p\tau_1} d_1 e^{pt}$, for $t \in [\tau_2, \tau_3)$ the solution is $x_3(t) = x_0 + e^{-p\tau_1} d_1 + e^{-p\tau_2} d_2 e^{pt}$, for $t \in [\tau_3, \tau_4)$ the solution is $x_4(t) = x_0 + e^{-p\tau_1} d_1 + e^{-p\tau_2} d_2 + e^{-p\tau_3} d_3 e^{pt}$ and for $t \in [\tau_4, T]$ the solution is $x_5(t) = x_0 + e^{-p\tau_1} d_1 + e^{-p\tau_2} d_2 + e^{-p\tau_3} d_3 + e^{-p\tau_4} d_4 e^{pt}$.

If we find the numerical value of the parameter such that the boundary condition (3) is satisfied, then we have determined that (3) satisfies the boundary condition (5), and (6) satisfies the solution of the differential equation with impulse effect. In this case, we move the solutions in the set of values defined in each interval to (3):

$$\begin{aligned} ax(0) + bx(t_1) + cx(T) &= ax_1(0) + bx_3(t_1) + cx_5(T) = \\ &= ax_0 + b x_0 + e^{-p\tau_1} d_1 + e^{-p\tau_2} d_2 e^{pt_1} + \\ &+ c x_0 + e^{-p\tau_1} d_1 + e^{-p\tau_2} d_2 + e^{-p\tau_3} d_3 + e^{-p\tau_4} d_4 e^{pT} = \\ &= a + be^{pt_1} + ce^{pT} x_0 + b e^{p(t_1-\tau_1)} d_1 + e^{p(t_1-\tau_2)} d_2 + \\ &+ c e^{p(T-\tau_1)} d_1 + e^{p(T-\tau_2)} d_2 + e^{p(T-\tau_3)} d_3 + e^{p(T-\tau_4)} d_4 = d. \end{aligned}$$

From this

$$x_0 = \frac{d - b e^{p(t_1-\tau_1)} d_1 + e^{p(t_1-\tau_2)} d_2 - c e^{p(T-\tau_1)} d_1 + e^{p(T-\tau_2)} d_2 + e^{p(T-\tau_3)} d_3 + e^{p(T-\tau_4)} d_4}{a + be^{pt_1} + ce^{pT}}$$

we obtain following :

for $t \in [0, \tau_1)$

$$x_1(t) = \frac{d - b e^{p(t_1-\tau_1)} d_1 + e^{p(t_1-\tau_2)} d_2 - c e^{p(T-\tau_1)} d_1 + e^{p(T-\tau_2)} d_2 + e^{p(T-\tau_3)} d_3 + e^{p(T-\tau_4)} d_4}{a + be^{pt_1} + ce^{pT}} e^{pt};$$

for $t \in [\tau_1, \tau_2)$

$$x_2(t) = \frac{d + ae^{-p\tau_1} d_1 - be^{p(t_1-\tau_2)} d_2 - c e^{p(T-\tau_1)} d_1 + e^{p(T-\tau_2)} d_2 + e^{p(T-\tau_3)} d_3 + e^{p(T-\tau_4)} d_4}{a + be^{pt_1} + ce^{pT}} e^{pt};$$

for $t \in [\tau_2, \tau_3)$

$$x_3(t) = \frac{d + ae^{-p\tau_1} d_1 + ae^{-p\tau_2} d_2 - c e^{p(T-\tau_1)} d_1 + e^{p(T-\tau_2)} d_2 + e^{p(T-\tau_3)} d_3 + e^{p(T-\tau_4)} d_4}{a + be^{pt_1} + ce^{pT}} e^{pt};$$

for $t \in [\tau_3, \tau_4)$

$$x_4(t) = \frac{d + ae^{-p\tau_1} d_1 + ae^{-p\tau_2} d_2 + ae^{-p\tau_3} d_3 + be^{p(t_1-\tau_3)} d_3 - ce^{p(T-\tau_4)} d_4}{a + be^{pt_1} + ce^{pT}} e^{pt}$$

and $t \in [\tau_4, T]$

$$x_5(t) = \frac{d + ae^{-p\tau_1}d_1 + ae^{-p\tau_2}d_2 + ae^{-p\tau_3}d_3 + ae^{-p\tau_4}d_4 + b e^{p(t-\tau_3)}d_3 + e^{p(t-\tau_4)}d_4}{a + be^{p\tau_1} + ce^{pT}} e^{pt}$$

In the solution of poisoning of the obtained results, it is necessary to determine whether (5), (6) differential equation satisfies the boundary condition (3) for $t \in [0, T]$.

$$x(t) = \frac{e^{pt}}{a + be^{p\tau_1} + ce^{pT}} \left\{ d + \sum_{i=1}^4 \left[\theta(t - \tau_i) ae^{-p\tau_i} d_i - \theta(\tau_i - t) ce^{p(T-\tau_i)} d_i \right] - \right. \\ \left. - b \sum_{i=1}^2 \theta(\tau_i - t) e^{p(t-\tau_i)} d_i + b \sum_{i=3}^4 \theta(t - \tau_i) e^{p(t-\tau_i)} d_i \right\} \quad (7)$$

Defined by (7) formula.

Well, let's look at the differential equation below, where the impulse effect has been increased

$$\frac{dx}{dt} = px, \quad t \neq \tau_i, \quad i = 1, 2, \dots, n, \quad (8)$$

$$\Delta \Big|_{t=\tau_i} = x(\tau_i + 0) - x(\tau_i - 0) = d_i, \quad i = 1, 2, \dots, n \quad (9)$$

here $\tau_i < t_1$, $i = 1, 2, \dots, n_1$ and $t_1 < \tau_i$, $i = n_1 + 2, \dots, n$.

In this condition, we defined the solution of (8), (9) differential equation with impulse effect which satisfy condition (3) by (7) formula

$$x(t) = \frac{e^{pt}}{a + be^{p\tau_1} + ce^{pT}} \left\{ d + \sum_{i=1}^n \left[\theta(t - \tau_i) ae^{-p\tau_i} d_i - \theta(\tau_i - t) ce^{p(T-\tau_i)} d_i \right] - \right. \\ \left. - b \sum_{i=1}^{n_1} \theta(\tau_i - t) e^{p(t-\tau_i)} d_i + b \sum_{i=n_1}^n \theta(t - \tau_i) e^{p(t-\tau_i)} d_i \right\} \quad (10)$$

For example, we defined the solution of following differential equations with impulse effects

$$\frac{dx}{dt} = 2x, \quad t \neq i, \quad i = 1, 2, 3, 4, \\ \Delta \Big|_{t=i} = x(i + 0) - x(i - 0) = 2^i, \quad i = 1, 2, 3, 4$$

which satisfy following condition

$$3x(0) + 4x(2,5) + x(5) = 10$$

by (10) or (7) formula. The solution for $t \in [0, 6]$ defined by

$$x(t) = \frac{e^{2t}}{3 + 4e^5 + e^{10}} \left\{ 10 + \sum_{i=1}^4 \left[3\theta(t - i) e^{-2i} d_i - \theta(i - t) e^{2(5-i)} d_i \right] - \right. \\ \left. - 4 \sum_{i=1}^2 \theta(i - t) e^{2(2,5-i)} d_i + 4 \sum_{i=3}^4 \theta(t - i) e^{2(2,5-i)} d_i \right\}$$

for $t \in [0, 1]$

$$x_1(t) = \frac{e^{2t}}{3 + 4e^5 + e^{10}} (10 - 2e^8 - 4e^6 - 8e^4 - 8e^3 - 16e^2 - 16e);$$

for $t \in [1, 2]$

$$x_2(t) = \frac{e^{2t}}{3 + 4e^5 + e^{10}} (10 - 4e^6 - 8e^4 - 16e^2 - 16e + 6e^{-2});$$

for $t \in [2, 3]$

$$x_3(t) = \frac{e^{2t}}{3 + 4e^5 + e^{10}} 10 + 6e^{-2} + 12e^{-4} - 8e^4 - 16e^2 ;$$

for $t \in [3, 4)$

$$x_4(t) = \frac{e^{2t}}{3 + 4e^5 + e^{10}} 10 + 6e^{-2} + 12e^{-4} + 24e^{-6} + 32e^{-1} - 16e^2 ;$$

and for $t \in [4, 5]$

$$x_5(t) = \frac{e^{2t}}{3 + 4e^5 + e^{10}} 10 + 6e^{-2} + 12e^{-4} + 24e^{-6} + 48e^{-8} + 32e^{-1} + 64e^{-3}$$

If we take this solutions to boundary conditions we obtain following

$$\begin{aligned} 3x(0) + 4x(2, 5) + x(5) &= 3x_1(0) + 4x_3(2, 5) + x_5(5) = \\ &= \frac{3}{3 + 4e^5 + e^{10}} 10 - 2e^8 - 4e^6 - 8e^4 - 8e^3 - 16e^2 - 16e + \\ &\quad + \frac{4e^5}{3 + 4e^5 + e^{10}} 10 + 6e^{-2} + 12e^{-4} - 8e^4 - 16e^2 + \\ &\quad + \frac{e^{10}}{3 + 4e^5 + e^{10}} 10 + 6e^{-2} + 12e^{-4} + 24e^{-6} + 48e^{-8} + 32e^{-1} + 64e^{-3} = \\ &= \frac{30 + 40e^5 + 10e^{10}}{3 + 4e^5 + e^{10}} = 10. \end{aligned}$$

This shows the correctness of the found solution

So let's think about the following differential equation, which is first order linear homogeneous differential equation with impulse effect at only two points

$$\frac{dx}{dt} = P(t)x, \quad t \neq \tau_1, \quad t \neq \tau_2, \quad (11)$$

$$\Delta \Big|_{t=\tau_i} = x(\tau_i + 0) - x(\tau_i - 0) = d_i, \quad i = 1, 2 \quad (12)$$

here $P(t)$ is defined in $[0, T]$ segment, a square matrix of dimension $n \times n$, d_1 and d_2 are given vector quantity. Let's consider the solution of (5),(6) differential equation with impulse effect which satisfy following three point boundary condition,

$$Ax(0) + Bx(t_1) + Cx(T) = d \quad (13)$$

here, for $X(t)$ matrix system of (11) $A + BX(t_1) + CX(T) \neq 0$ and $\tau_1 < t_1 < \tau_2$. A, B and C are square matrix of dimension $n \times n$, d is given vector quantity.

Let's the solution of (11),(12) differential equation systems for $t \in [0, \tau_1)$ is $x_1(t)$, for $t \in [\tau_1, \tau_2)$ is $x_2(t)$ and for $t \in [\tau_2, T]$ is $x_3(t)$. Then we know, the solution of (11),(12) differential equation systems with impulse effect for $t \in [0, \tau_1)$ is $x_1(t) = X(t)c_1 = X(t)x_0$, for $t \in [\tau_1, \tau_2)$ is $x_2(t) = X(t)c_2$, in point $t = \tau_1$ according to condition (12) we obtain following equality

$$\Delta \Big|_{t=\tau_1} = x(\tau_1 + 0) - x(\tau_1 - 0) = (c_2 - x_0)X(\tau_1) = d_1$$

here $X(t)$ is the matrix of system (11). From this $c_2 = x_0 + X^{-1}(\tau_1)d_1$, and we take this to solution $x_2(t) = X(t)c_2$ we obtain following

$$x_2(t) = X(t) x_0 + X^{-1}(\tau_1)d_1$$

here $x_0 = x(0)$.

So, for $t \in [\tau_2, T]$ in solution $x_3(t) = X(t)c_3$ we need find c_3 , here in point $t = \tau_2$ according to condition (12) we obtain following equality

$$\Delta|_{t=\tau_2} = x(\tau_2 + 0) - x(\tau_2 - 0) = X(t) c_3 - x_0 - X^{-1}(\tau_1)d_1 = d_2$$

form this $c_2 = x_0 + X^{-1}(\tau_1)d_1 + X^{-1}(\tau_2)d_2$, and we take this to solution $x_3(t) = X(t)c_3$

$$x_3(t) = X(t) x_0 + X^{-1}(\tau_1)d_1 + X^{-1}(\tau_2)d_2$$

As a result, we obtain following general solution in Koshi form of (11),(12) differential equation with impulse effect

$$\text{for } t \in [0, \tau_1), x_1(t) = X(t)x_0;$$

$$\text{for } t \in [\tau_1, \tau_2), x_2(t) = X(t) x_0 + X^{-1}(\tau_1)d_1; \quad (14)$$

$$\text{for } t \in [\tau_2, T], x_3(t) = X(t) x_0 + X^{-1}(\tau_1)d_1 + X^{-1}(\tau_2)d_2$$

So we need define x_0 which satisfy condition (13), for this we take (14) to (13):

$$\begin{aligned} Ax(0) + Bx(t_1) + Cx(T) &= Ax_1(0) + Bx_2(t_1) + Cx_3(T) = \\ &= Ax_0 + BX(t_1) x_0 + X^{-1}(\tau_1)d_1 + CX(T) x_0 + X^{-1}(\tau_1)d_1 + X^{-1}(\tau_2)d_2 = \\ &= A + BX(t_1) + CX(T) x_0 + BX(t_1)X^{-1}(\tau_1)d_1 + CX(T) X^{-1}(\tau_1)d_1 + X^{-1}(\tau_2)d_2 = d. \end{aligned}$$

from this

$$x_0 = A + BX(t_1) + CX(T)^{-1} \left[d - BX(t_1, \tau_1)d_1 - C X(T, \tau_1)d_1 + X(T, \tau_2)d_2 \right]$$

We take these equalities to (14)

for $t \in [0, \tau_1)$

$$x_1(t) = X(t) A + BX(t_1) + CX(T)^{-1} \cdot$$

$$\cdot \left[d - BX(t_1, \tau_1)d_1 - C X(T, \tau_1)d_1 + X(T, \tau_2)d_2 \right];$$

for $t \in [\tau_1, \tau_2)$

$$x_2(t) = X(t) A + BX(t_1) + CX(T)^{-1} \left[d + AX^{-1}(\tau_1)d_1 - CX(T, \tau_2)d_2 \right];$$

for $t \in [\tau_2, T]$

$$x_3(t) = X(t) A + BX(t_1) + CX(T)^{-1} \left[d + AX^{-1}(\tau_1)d_1 + AX^{-1}(\tau_2)d_2 + BX(t_1, \tau_2)d_2 \right]$$

Taking into account the results obtained

$$\Delta|_{t=\tau_i} = x(\tau_i + 0) - x(\tau_i - 0) = d_i, \quad i = 1, 2, 3, 4$$

The solution of system (11) which satisfy boundary condition (13) for every $t \in [0, T]$ we can define following formula

$$\begin{aligned} x(t) = X(t) A + BX(t_1) + CX(T)^{-1} &\left\{ d + \sum_{i=1}^4 \left[\theta(t - \tau_i) AX^{-1}(\tau_i)d_i - \right. \right. \\ &\left. - \theta(\tau_i - t) CX^{-1}(T, \tau_i)d_i \right] - B \sum_{i=1}^2 \theta(\tau_i - t) X(t_1, \tau_i)d_i + b \sum_{i=3}^4 \theta(t - \tau_i) X(t_1, \tau_i)d_i \left. \right\} \end{aligned} \quad (15)$$

If we look at the differential equation below, where the impulse effect has been increased

$$\frac{dx}{dt} = P(t)x, \quad t \neq \tau_i, \quad i = 1, 2, \dots, n,$$

$$\Delta \Big|_{t=\tau_i} = x(\tau_i + 0) - x(\tau_i - 0) = d_i, \quad i = 1, 2, \dots, n$$

In this condition, the solution which satisfy boundary condition (13) we can defined by (15) formula

$$x(t) = X(t) \left[A + BX(t_1) + CX(T) \right]^{-1} \left\{ d + \sum_{i=1}^n \left[\theta(t - \tau_i) AX^{-1}(\tau_i) d_i - \right. \right. \\ \left. \left. - \theta(\tau_i - t) CX^{-1}(T, \tau_i) d_i \right] - B \sum_{i=1}^{n_1} \theta(\tau_i - t) X(t_1, \tau_i) d_i + B \sum_{i=n_1+1}^n \theta(t - \tau_i) X(t_1, \tau_i) d_i \right\}$$

here $\tau_i < t_1, \quad i = 1, 2, \dots, n_1$ and $t_1 < \tau_i, \quad i = n_1 + 1, \dots, n$.

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Rezyume: Maqolada impuls tasirida birinchi tartibli chiziqli birjinsli differentsial tenglamalar uchun uch nuqtali chegaraviy masalalar ko'rib chiqiladi.

Резюме: В статье рассматриваются трехточечные краевые задачи для линейных однородных дифференциальных уравнений того же порядка, что и поле импульсов.

Kalit so'zlar: Chiziqli birjinsli diferentsial tenglama, uch nuqtali chegraiy masala, impuls tasiri

Ключевые слова: Линейное однородное дифференциальное уравнение, трехточечная краевая задача, импульсный эффект

ANTIHELMINTH ACTIVITY OF SUPRAMOLECULAR DRUGS PRAZIQUANTEL IN SCHISTOSOMIASIS OF SHEEP OF KARAKALPAKSTAN

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Summary: *The article is devoted to the study of the effectiveness of praziquantel supramolecular complexes against sheep schistosomiasis in the Republic of Karakalpakstan. The article deals with the information about the epizootic situation regarding schistosomiasis in animals in the Republic of Karakalpakstan that remains quite tense, necessitating continuous monitoring and a comprehensive set of preventive measures. In aquatic and near-water ecosystems, where the main habitats of wild and domestic animals are concentrated, Sch. turkestanicum populations are significantly widespread. The author concludes that schistosomiasis is a parasitic disease caused by blood flukes (trematode worms) of the genus Schistosoma, the most effective approach to combating these parasites is deworming the infected animals.*

Key words: *helminthiasis, schistosomiasis, praziquantel, fenbendazole, supramolecular complexes.*

Introduction. Currently, the epizootic situation regarding schistosomiasis in animals in the Republic of Karakalpakstan remains quite tense, which requires constant monitoring and a set of preventive measures. In aquatic and near-water ecosystems, where the main habitats of wild and domestic animals are concentrated, populations of Sch. turkestanicum are significantly widespread. They have adapted to parasitize the vessels of the circulatory system of mammals and cause serious diseases in animals, causing enormous damage to the livestock sector [1]. The presence in the assortment of highly effective, widely available and easy-to-use anthelmintics determines the success of deworming animals, which is the main link in the chain of anthelmintic measures [2; 8].

One of the widely used anthelmintics to combat helminthiasis in animals are the drugs ivermectin, praziquantel, fenbendazole, which have a helminthocidal effect. Praziquantel (PZK) (azinox, biltricid, drontal, droncit) is the most widely used anthelmintic drug on the WHO list and the main drug for the treatment of humans and animals with opisthorchiasis, clonorchiasis, schistosomiasis, echinococcosis, cysticercosis, hymenolepiasis and other intestinal cestodiasis [7].

Praziquantel is highly effective against schistosomiasis (*Schistosoma turkestanicum*) in animals and it causes various types of degeneration of organs and tissues of *Schistosoma turkestanicum*, as well as irreversible degenerative changes in male and female trematodes. The disadvantages of these drugs (praziquantel, fenbendazole) include low solubility, poor absorption by the intestinal mucosa and, as a consequence, poor bioavailability and high doses against helminth infections in animals [5]. All this required the creation of a supramolecular system of praziquantel and fenbendazole with increased efficiency using mechanochemical technology and targeted delivery [3].

Considering the data on the high effectiveness of praziquantel-based drugs obtained by mechanochemical methods, it was of scientific and practical interest to obtain new compositions based on PZK and study them on sheep spontaneously infected with schistosomes (*Schistosoma turkestanicum*).

To obtain PZK compositions, the following substances and materials were used:

- Praziquantel [2-(cyclohexylcarbonyl) – 1,2,3,6,7,11b-hexahydro – 4H – pyrazino [2,1 - a] isoquinoline – 4 – he] – white crystalline powder with a content of 98.5% o .V. Manufactured by Shanghai Joiaiy Pharmaceutical Co., Ltd. (China, China).

- Polyvinylpyrrolidone (PVP) – 1 ethenylpyrrolidin-2-one grade K-30. Manufacturer Boai NKY Pharmaceuticals Ltd. (PRC). Series P160828002-0/

- Arabinogalactan (AG) brand "Levitrol-arabinogalactan" TY 9325-008-70692152-08. Manufacturer: Ametis JSC (Russia, Blagoveshchensk).

- Licorice extract (GL) – dry fine powder of dark brown color containing 24.9% HA produced by Visterra LLC, Altai Territory (Declaration of Conformity TCN RU D-RU. AF96.B.00958).

- dioctyl sulfosuccine sodium (SDS) with a main substance content of 96% (Acras Organics, New Jersey, USA) - fine, hygroscopic powder with a slightly bitter, soapy taste Solid dispersions of PZK with polymers and CH were obtained according to the method described previously [6;11;12].

The solubility of the obtained SDs was determined by dissolving them in water and determining the concentration of PZK by HPLC at 360 nm. and octanol odor.

Materials and research methods. Testing of the helminthocidal activity of the drugs was carried out on sheep spontaneously infected with schistosomiasis in sheep farms of the Kungrad and Bozatau regions of the Republic of Karakalpakstan. The experiments were carried out in October 2023 with the participation of scientists from the Laboratory of General Parasitology of the Institute of Zoology of the Academy of Sciences of Uzbekistan and veterinary specialists from Karakalpakstan. Experiments to test drugs were carried out on animals spontaneously infected with schistosomes, the causative agents of sheep schistosomiasis, using generally accepted methods [8; 9]. The experimental results were statistically processed using the geometric mean number of schistosomes to compare differences between the experimental and control groups. SAS/Stat (version 9.4) was used for statistical analysis of the study results.

Research results. The compositions of PZK obtained using mechanochemical technology in the form of SD were analyzed for changes in solubility. The results of the study are presented in Table 1.

Table 1.

Solubility of solid dispersions (SD) of praziquantel in water.

Analysis accuracy $\pm 3\%$

Composition of SD samples obtained after 4 hours of mechanical treatment	Solubility in water, mg/l	Increase in solubility, times
Original shut-off valve, without machining	400,0	-
SD composition PZK:PVP (10:90)	3195,0	8
SD composition PZK: PVP:SN (10:89:1)	5211,0	13
SD composition PZK: AG: SN (10:89:1)	4397,0	11
SD composition PZK: ES: SN (10:89:1)	5989,0	15

Analysis of the data in Table 1 confirmed an increase in the solubility of PZK in the resulting compositions, which suggested a corresponding increase in anthelmintic activity.

The anthelmintic activity of the resulting praziquantel compositions against schistosome (*Schistosoma turkestanicum*) was studied in farms of the Bozatau region of the Republic of Karakalpakstan on young Karakul sheep (weighing from 25 to 35 kg) during the winter period (December 2022 and January - February 2023). The animals were kept in stalls during the experiment (Table 2).

Table 2.

Efficacy of praziquantel compositions in the form of solid dispersions with polymers and an emulsifier (CH) against sheep schistosomiasis

№	variant	Dose, mg/kg	Average dose per head of sheep, mg/kg	Experimental sheep	Freed from invasion	Schistosoma detected after deworming, $M \pm m$	EE, %	IE, %
1	Control	-	-	8	-	386 $\pm$ 1.5	-	-
2	PZK:PVP	3.0	88,1	8	8	-	100.0	100.0
		2.0	59,7	7	7	-	100.0	100.0
		1.0	31,0	8	4	48 $\pm$ 0.21	50.0	87.6
3	PZK:PVP:SN	3.0	91,3	7	7	-	100.0	100.0
		2.0	58,3	7	7	-	100.0	100.0
		1.0	29,9	8	6	56 $\pm$ 0.23	75.0	85.5
4	PZK:AG:SN	3.0	90,8	8	8	-	100.0	100.0
		2.0	58	8	8	-	100.0	100.0

		1.0	30,8	8	5	72±0.29	62.5	81.4
5	PZK:ES:SN	3.0	90,0	7	7	-	100.0	100.0
		2.0	60,3	7	7	-	100.0	100.0
		1.0	30,0	7	4	84±0.34	50.0	78.3
6	PZK substance	3.0	93,0	8	8	-	100.0	100.0
		2.0	61,3	8	6	69±0.28	75.0	82.2

The experiments were carried out on 132 individuals of Karakul sheep, from which experimental and control groups were formed. Animals of the experimental groups were given a single oral dose of PZK compositions in doses of 1.0, 2.0 and 3.0 mg/kg body weight. The control groups of animals were not given the drug. The sheep of the experimental groups consisted of 114 individuals; the number of animals in each group ranged from 21 to 24.

To determine the infection of sheep with schistosomes (*Schistosoma turkestanicum*), fecal samples were examined using the generally accepted method of successive washings, taking into account the number of schistosome eggs in 1 g of feces to distribute animals into groups. The effectiveness of the drugs was determined based on the results of a study of slaughtered animals using the method of complete helminthological dissection of animals and their individual organs - the liver of the mesenteric vessels, where, as a rule, mature schistosomes are concentrated. Sheep with schistosomiasis were divided into six equal groups based on the number of schistosome eggs in 1 g of feces. The resulting SD of praziquantel was administered to sheep of the experimental groups in recommended doses of 1.0, 2.0 and 3.0 mg/kg with water. Animals of the 6th group received praziquantel substance. The sheep of the control (1) group were not given the drug.

The effectiveness of the drugs against *Schistosoma turkestanicum* was established on the 10th and 13th days after administration based on the results of helminthological dissections of the liver and mesenteric vessels of the experimental and control groups of animals. Test data is presented in Table 2.

Analysis of the data in Table 2 confirmed the high efficiency of the resulting compositions of praziquantel in the form of SD with polymers and an emulsifier. When tested on sheep, the compositions were 100% effective against *Schistosoma turkestanicum* at doses of 2 and 3 mg/kg. The dose of 1 mg/kg was less effective, 50.0 – 74.9%. In sheep that were not freed from invasion in groups, *Schistosoma turkestanicum* was found in the liver and mesenteric vessels in quantities (on average) from 48±0.21 to 84±0.34 specimens. When opening animals, after administration of the compositions at a dose of 1 mg/kg, a significantly lower number of schistosomes was found in all dewormed groups compared to the control group. Praziquantel substance at a dose of 1 mg/kg was insufficiently effective (25.5%) against *Schistosoma turkestanicum*. An average of 386 specimens were found in the liver and mesenteric vessels of control sheep. schistosomes, consisting of males and females.

During the experiments, the degenerative processes of the tegument of *Schistosoma turkestanicum* were significantly accelerated. Already 16–18 hours after the use of the drugs, a homogeneous mass of schistosomes was observed in the venous vessels of the mesentery of experimental sheep.

Conclusion. Considering that schistosomiasis is an acute and chronic parasitic disease caused by blood flukes (trematode worms) of the genus *Schistosoma*, the most promising solution to the problem of combating these parasites is deworming of infected animals. Therefore, the developed PZK compositions and their low doses are likely to facilitate widespread use in veterinary and medical practice for the control and prevention of schistosomiasis in animals and humans. In this context, the proposed drugs based on mechanochemical treatment contributed to a significant reduction in dosage (from 25 mg/kg to 2-3 mg/kg) and maintaining their high effectiveness for the prevention of schistosomiasis in animals, as evidenced by the results of our studies.

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Rezyume: *Maqola hayvonlar gelmintoziq qarshi prazikvantel supramolekulyar birikmalarining samaradorligini o'rganishga bag'ishlangan. Maqolada Qoraqalpog'iston Respublikasida hayvonlarda shistosomiaz kasalligi bilan bog'liq epizootik vaziyat to'g'risidagi ma'lumotlar ko'rib chiqiladi, bu esa doimiy monitoring va kompleks profilaktika choralarini ko'rishni taqozo etadi. Yovvoyi va uy hayvonlarining asosiy yashash joylari to'plangan suv va suvga yaqin ekotizimlarda Sch. turkestanicum populyatsiyalari sezilarli darajada keng tarqalgan. Muallifning xulosasiga ko'ra, shistosomiaz - shistosoma jinsiga mansub qon to'kilishi (trematoda qurtlari) keltirib chiqaradigan parazitlar kasalligi, bu parazitlarga qarshi kurashning eng samarali usuli kasal hayvonlarni degelmintizatsiya qilishdir.*

Резюме: *Статья посвящена изучению эффективности супрамолекулярных комплексов празиквантела против гельминтозов животных. В статье рассмотрена информация об эпизоотической ситуации по шистосомозу животных в Республике Каракалпакстан, которая остается достаточно напряженной, что обуславливает необходимость постоянного наблюдения и комплексного комплекса профилактических мероприятий. В водных и околотоводных экосистемах, где сосредоточены основные места обитания диких и домашних животных, Sch. Популяции turkestanicum значительно широко распространены. Автор приходит к выводу, что шистосомоз - паразитарное заболевание, вызываемое кровяными сосальщиками (трематодами) рода Schistosoma, наиболее эффективным способом борьбы с этими паразитами является дегельминтизация зараженных животных.*

Kalit so'zlar: *gelmintozlar, shistosomiazlar, prazikvantel, fenbendazol, supramolekulyar komplekslar.*

Ключевые слова: *гельминтозы, шистосомоз, празиквантел, фенбендазол, супрамолекулярные комплексы.*

PRODUCTION OF CATALYST FOR ACETONE SYNTHESIS

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Summary: *In connection with the industrial implementation of the acetylene hydration process (for the first time in Germany in 1916), great importance was attached to the study of metallocomplex catalysts, especially mercury-free ones. It was tried to change the preparation method of the catalyst for the synthesis of acetone from acetylene and add salts of various d-elements to it as a promoter. The catalyst was prepared in two ways: precipitation and absorption. The use of new highly efficient nano catalysts leads to the improvement of the environmental characteristics of processes and technologies in industry, the reduction of harmful emissions into the atmosphere, the creation of environmentally friendly types of alternative energy resources, and new products and materials.*

Key words: *"Wet" and suspension, acetone, acetylene, water, YKS, nanocatalyst, bentonite.*

The hydration of acetylene (and its derivatives) in a solution of Hg(II) salts, discovered by M.G.Kucherov in 1881, has long been important in industrial organic synthesis [1-2]. Catalytic ternary hydration is the most widely used synthesis method in synthetic chemistry and can again be an important industrial process under certain conditions using mercury-free catalysts and dilute acetylene. The results of the study of acetylene hydration up to 1967 have been covered in monographs and the synthetic aspect of the use of this reaction has been covered in general articles [3]. The triplet hydration reaction is accelerated in heterogeneous catalysts with protic acids, bases, metal complexes, salts and oxides. If acetylene can hardly bind a water molecule in concentrated sulphuric acid (the rate constant of this reaction is 100 times smaller than that of ethylene hydration), substituted acetylenes are hydrated under milder conditions. The rate of the catalytic reaction of the hydration of acetylene compounds in dilute acids is explained by the first order equation for the alkyne and the hydroxonium ion:

$$W=k[HC\equiv CR][H_3O^+]$$

Asetilening gidratlanish jarayonini sanoatda amalga oshirish (birinchi marta Germaniyada 1916 yilda) munosabati bilan metallokompleks katalizatorlarni, ayniqsa simobsizlarini, o'rganishga katta ahamiyat berildi[3-5].

Sanoatda ishlatiladigan simobli katalizatorning ([% mass]: 0,2-HgSO₄, 20-Fe₂(SO)₃, 8-10-H₂SO₄ va 1-2 FeSO₄) asosiy kamchiligi Hg (II) ning qaytarilishi

In connection with the industrial implementation of the acetylene hydration process (for the first time in Germany in 1916), significant emphasis was placed on the study of metallocomplex catalysts, with a particular focus on those that did not contain mercury [3-5].

The principal disadvantage of the industrial mercury catalyst (comprising 0,2-HgSO₄, 20-Fe₂(SO)₃, 8-10-H₂SO₄ va 1-2 FeSO₄) is its deactivation due to the reduction of Hg (II) (under standard conditions, this occurs within a period of 3-4 hours). Furthermore, the catalyst results in the emission of mercury vapours and mercury organic compounds, as well as gas emissions. The stability of the catalyst can be enhanced and the release of mercury reduced by conducting the process in an electrochemical system (where mercury is oxidised at the anode during the catalytic reaction) or by adding a β-thiodiglycol solution (at a concentration of 0.3-2%) to the contact solutions. In the second case, the stability of the catalyst is enhanced by a factor of seven to eight, while its activity exhibits a slight decline. The stationary concentration of mercury in the solution increases by 1% (mass) [6].

An attempt was made to modify the method of preparing the catalyst for the synthesis of acetone from acetylene by incorporating salts of various d-elements as a promoter. The catalyst was prepared in two ways: precipitation and absorption.

The production of the $5\%ZnO \cdot 5\%Fe_2O_3 \cdot 5\%Cr_2O_3 \cdot 3\%MnO_2 \cdot 1\%V_2O_5$ catalyst comprises the following principal stages: acid treatment and high-silica zeolite activation; mixing and forming; and thermal treatment of the catalyst. The acid treatment and activation are conducted in a reactor equipped with a mechanical stirrer. The calculated amount of HCV is directed to the reactor (1), and a specific quantity of 10% sulfuric acid is delivered to the same location. The components are mixed for one hour, washed, and then dried at $95^\circ C$ for three hours (2). Concurrently, the coal is crushed in the mill (8). The mixture of components is directed to the mixer (11), where it is subjected to intensive mixing. Subsequently, three-quarters of the aqueous solution of the peptizer (which is in the form of an extractive phosphoric acid solution) is added. The mixing process is continued until a homogeneous mass is obtained.

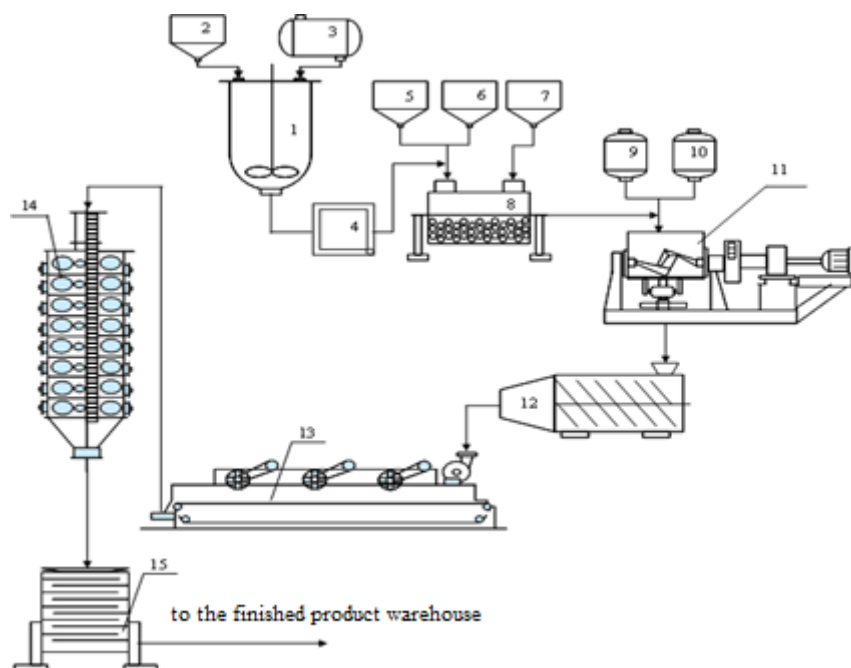


Figure 1. Technological scheme of catalyst production $ZnO \cdot Fe_2O_3 \cdot Cr_2O_3 \cdot MnO_2 \cdot V_2O_5$ /HCT

- 1 – aralashtirgich-aktivator; 2 – HCT uchun bunker;
 3 – 10 %-li sulfat kislota uchun sig‘im; 4 – quritish shkafi;
 5, 6, 7 – $Zn(NO_3)_2 \cdot 6H_2O$, $Fe(NO_3)_3 \cdot 6H_2O$, $Cr(NO_3)_3 \cdot 9H_2O$ va $Mn(NO_3)_2 \cdot 6H_2O$ uchun sig‘imlar; 8 – sharchali tegirmon; 9, 10 – distillangan suv uchun sig‘im; 11 – kurakli aralashtirgich; 12 – shakl berish mashinasi;
 13 – transporterli quritgich; 14 – shaxtali kuydirish pechi;
 15 – vibrog‘alvir
 1 – mixer-aktivator; 2 – bunker for HCT;
 3 – capacity for 10% sulfuric acid; 4 – drying cabinet;
 5, 6, 7 – capacities for $Zn(NO_3)_2 \cdot 6H_2O$, $Fe(NO_3)_3 \cdot 6H_2O$, $Cr(NO_3)_3 \cdot 9H_2O$ and $Mn(NO_3)_2 \cdot 6H_2O$; 8 – ball mill; 9, 10 - capacity for distilled water; 11 – shovel mixer; 12 – forming machine;
 13 – conveyor dryer; 14 – mine incineration furnace;
 15 – vibro sieve

Once the pre-prepared retainer has undergone the requisite drying process, it is crushed in a mill (8) and conveyed to a mixer (11) for incorporation with the remaining components. At this juncture, a quarter-sized quantity of peptizer is introduced. The mixing process is continued for a period of 30 to 40 minutes, after which the resulting mass is directed to the shaping stage (12). A screw forming machine was selected for this purpose, as it allows the production of pellets with a diameter of 6-8 mm and a length of 8-10 mm. The granules exiting the granulator exhibit a moisture

content of 20-25%. The contact mass was subjected to drying in a dryer (13) at a temperature of $100 \pm 5^{\circ}\text{C}$ for a duration of 5 hours.

The catalyst is subjected to a heat treatment process in a drum-type furnace (14), wherein combustible gases and raw pellets must traverse the furnace in a countercurrent flow. The initial temperature for combustion is 200°C , with an incremental increase of 50°C every 30 minutes, reaching a maximum temperature of $450\text{-}500^{\circ}\text{C}$. Following the combustion of the catalyst, it is subjected to a sieving process in a vibro sieve (15) and subsequently transferred to the warehouse designated for finished products.

The utilisation of novel, highly efficient nanocatalysts has the potential to enhance the environmental profile of industrial processes and technologies, reduce harmful emissions into the atmosphere, facilitate the development of environmentally friendly alternative energy sources and drive the creation of new products and materials.

In order to ascertain the adsorption capacity of bentonite clays, it is first necessary to determine their chemical composition and mineralogical properties. A study was conducted to determine the chemical composition of various bentonite clays in Uzbekistan (Table 1).

Table 1. Chemical composition of some clays of Uzbekistan

Area	Name of chemical elements, %											
	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	TiO ₂	CaO	MgO	Na ₂ O	K ₂ O	P	S	N	S
Kattakurgan bentonite	60.5	20.9	12.0	0.67	2.60	2.95	0.06	2.07	0.04	0.01	0.09	0.07
Nurota bentonite	61.1	17.81	8.33	0.55	3.74	2.94	0.47	1.53	0.31	0.03	0.04	0.03
Navbahor bentonite	61.59	18.01	7.31	0.76	3.15	3.58	0.12	1.67	0.35	0.02	0.06	0.04

As can be seen from Table 1, the studied samples contain silicon (IV) oxide from Kattakurgan bentonite-60.5, Nurota bentonite-61.1 and Navbahor bentonite-61.59, but the composition of metal oxides differs from each other.

Table 2 shows the results of dispersion analysis studies of the composition of fractions on selected clay (%).

Table 2. Analysis of dispersion composition of clays in Uzbekistan

Area	Fraction volume, mm		
	0.06	0.06-0.0015	0.0015 mm or less
Kattaqo'rg'on bentonit	0.6	2.9	96.5
Nurota bentonit	0.7	2.8	96.6
Navbahor bentonit	2.8	4.7	92.5

The high proportion of finely dispersed fraction and the specific structure of minerals belonging to the montmorillonite group are the determining factors in the valuable qualities of bentonite clays.

The activation process was conducted using a conventional acid activation method with an acid concentration of 10-20% and a solid-to-liquid ratio of 1:3 to 1:5, depending on the duration of the process. The activation was carried out at approximately 60% consumption. The process was completed within a timeframe of 2-4 hours, with the finished product subsequently washed and ground in accordance with its intended direction of use. The results are presented in tabular form in Table 3.

Table 3. The alteration of pivotal components throughout the course of acid activation

Activation time, hour	Acid concentration, H ₂ SO ₄						Acid concentration, HCl					
	10		15		20		10		15		20	
	Content, %						Content, %					
	SiO ₂	Al ₂ O ₃	SiO ₂	Al ₂ O ₃	SiO ₂	Al ₂ O ₃	SiO ₂	Al ₂ O ₃	SiO ₂	Al ₂ O ₃	SiO ₂	Al ₂ O ₃
2	62.3	18.7	63.1	18.4	63.5	17.8	61.9	17.9	62.4	17.1	63.5	16.8
4	67.5	17.4	68.8	15.5	68.6	14.5	66.6	16.4	67.2	16.1	66.5	15.6
6	71.8	14.9	73.8	13.4	75.7	12.6	70.2	15.9	72.4	14.4	73.8	13.7
8	80.3	12.2	81.7	11.5	82.4	10.4	75.4	14.3	76.5	13.8	77.2	13.1

As illustrated in Table 4, the chemical composition and, consequently, the crystal structure of clay samples have undergone notable alterations following acid activation. This is evidenced by an increase in the SiO₂ content and a pronounced reduction in Al₂O₃ in the samples. This can be explained by the presence of the following main isomorphic substitutions in clay minerals: The substitutions observed were as follows: Si⁴⁺ in Al³⁺; Mg²⁺ da Al³⁺; Al³⁺ in Fe³⁺; 2Al³⁺ in 3Mg²⁺ to; 3Fe²⁺ in 2Al³⁺.

The impact of heating temperature on the characteristics of the pore structure of columnar bentonites. The processing of Navbahor modified bentonite at temperatures exceeding 700 °C results in the release of water between the layers and a deterioration of the textural properties, accompanied by irreversible adhesion of the layers. Nevertheless, as illustrated in Figure 3, the pore structure parameters of the initial clay samples exhibited minimal alterations within the heating temperature range of 70-500°C.

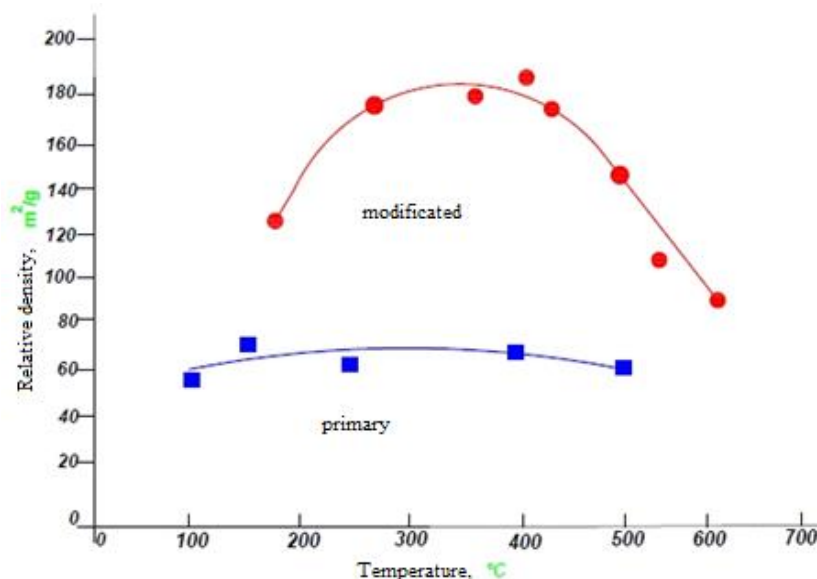


Figure 2. The effect of heating temperature on the surface of bentonite

When bentonite is modified in a 10% aqueous solution of sulfuric acid, calcium ions are almost completely removed within the first two hours. It is hypothesised that this process is more pronounced in bentonite activated with sodium ions, and less so in organomodified clay. The concentration of silica increases monotonically for all test samples as elements other than bentonite are leached.

The addition of manganese and vanadium compounds to zinc and iron/chromium compounds results in the formation of a catalyst that subsequently leads to the production of acetone. Table 4 illustrates the impact of catalyst active components on the yield of reaction products.

Table 4. The impact of catalyst composition on the yield of reaction products

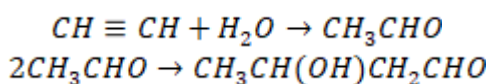
№	Catalyst content, mass %	Acetylene conversion, %	Productivity, %	
			Acetaldehyde	Acetone
1	ZnO:Fe ₂ O ₃ /HCT	52.7	19.5	79.8
2	ZnO:Cr ₂ O ₃ /HCT	53.1	18.9	80.4
3	ZnO/:Fe ₂ O ₃ :MnO ₂ /HCT	62.4	18	81.4
4	ZnO:Cr ₂ O ₃ :MnO ₂ /HCT	63.2	17.2	82.1
5	ZnO:Fe ₂ O ₃ :Cr ₂ O ₃ /HCT	70.2	13.5	85.8
6	ZnO:Fe ₂ O ₃ :Cr ₂ O ₃ :MnO ₂ /HCT	75.8	11.5	87.7
7	ZnO/:Fe ₂ O ₃ :MnO ₂ :V ₂ O ₅ /HCT	85.7	7.3	92
8	ZnO:Cr ₂ O ₃ :MnO ₂ :V ₂ O ₅ /HCT	92.8	5	94.3
9	ZnO:Fe₂O₃:Cr₂O₃:MnO₂:V₂O₅/HCT	97.2	2.2	96.3
10	ZnO:Co ₂ O ₃ :Cr ₂ O ₃ :MnO ₂ :V ₂ O ₅ /HCT	90.2	6.2	93.3
11	ZnO:Co ₂ O ₃ :Cr ₂ O ₃ :Mn ₂ O ₃ :V ₂ O ₅ /HCT	84.3	9.1	90.3
12	ZnO:Fe ₂ O ₃ :Cr ₂ O ₃ :Mn ₂ O ₃ :V ₂ O ₅ /HCT	78.3	15.8	83.5

As illustrated in the table, the presence of catalyst No. 9, comprising ZnO:Fe₂O₃:Cr₂O₃:MnO₂:V₂O₅/HCT oxides, has resulted in a yield of acetone formation of 96.3%, a yield of acetaldehyde formation of 2.8%, and a conversion of acetylene of 97%.

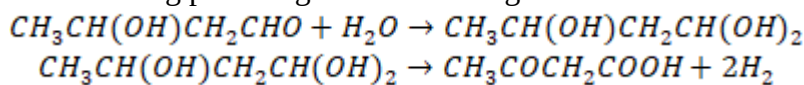
The ratio of the height of the catalyst layer to the diameter of the reactor is 50-60, and the volume speed of acetylene is 180 h⁻¹. In these conditions, catalyst #9 functions for 300 hours with consistent activity. Following a 18-24 hour regeneration period, the catalyst fully restores its activity.

It is established in the literature that the interaction of polarised acetylene molecules with water molecules results in the formation of unstable vinyl alcohol, which subsequently isomerises to acetaldehyde. The formed acetaldehyde then undergoes an aldol condensation reaction, followed by a subsequent croton condensation reaction, to form either a 3-oximoyl aldehyde or a croton aldehyde. 3-oximoyl and crotonaldehydes undergo a reaction with water, forming hydrates.

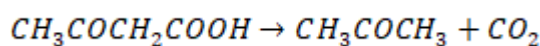
In light of the experimental results and the qualitative and quantitative composition of the reaction products, we put forth the following mechanism for acetone formation in the presence of the specified catalyst:



The hydration of 3-oxybutanal results in the formation of a trihydric alcohol, whereas the dehydrogenation of the resulting product gives rise to the generation of acetoacetic acid.



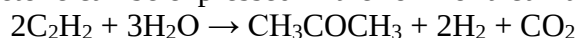
In accordance with the specified conditions, acetoacetic acid is decarboxylated, resulting in the formation of acetone.



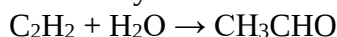
The aforementioned method for the synthesis of acetone is a more promising avenue for investigation in Uzbekistan. In order to establish the scientific basis of the process of obtaining

acetone by hydrating acetylene, it is necessary to conduct a detailed study of the kinetic processes of the reaction in the catalyst and to devise a production mechanism for the aforementioned processes.

The formation of acetone can be expressed in the form of a cumulative equation, as follows:



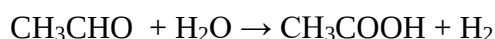
The formation of acetylene is determined based on the mechanism, resulting in the formation of acetylene hydration and acetaldehyde.



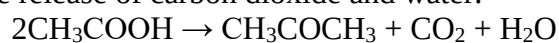
Acetaldehyde then reacts with water vapour to form acetone, as follows:



The formation of acetic acid as a consequence of the reaction may also be attributed to the following reaction:



A portion of the acetic acid produced subsequently undergoes decarboxylation to yield acetone, accompanied by the release of carbon dioxide and water.



The aforementioned method of obtaining acetone is a more promising avenue for Uzbekistan.

In the case of parallel reactions, the conversion of component i in reaction j is determined by the expression $\zeta_{i,j}$:

$$\sum_{j=1}^R \zeta_{i,j} = \frac{x_{i,in}L_{in} - x_{i,out}L_{out}}{x_{i,in}L_{in}}$$

These are the inputs and outputs proposed by L_{in} and L_{out} , and there is only one $\zeta_{i,j}$ conversion representation for a reaction. This conversion determines the efficiency of the reaction through the following equation:

$$r_j = -\frac{\zeta_{i,j}}{v_{i,j}} x_{i,in} L_{in}$$

The addition expression above necessitates a specific sequence of input parameters, thereby allowing only one $\zeta_{i,j}$ conversion per reaction. A non-periodic conversion may result in a negative output, which can lead to an error message on the device itself.

An expression utilising a conversion for consecutive (series) reactions is as follows:

$$\begin{aligned} \zeta_{i,j} &= \frac{x_{i,in}L_{in} - x_{i,1}L_1}{x_{i,in}L_{in}} \\ \zeta_{m,j} &= \frac{x_{m,j-1}L_{j-1} - x_{m,j}L_j}{x_{m,j-1}L_{j-1}} \\ \zeta_{k,R} &= \frac{x_{k,R-1}L_{R-1} - x_{k,out}L_{out}}{x_{k,R-1}L_{R-1}} \end{aligned}$$

In this context, the total intermediate flow rate L_i is calculated in accordance with the overall material balance. In the Aspen Plus program, this equation is performed in the same sequence for all reactions.

Conclusion

In summary, the kinetic laws of catalytic hydration reactions of acetylene were studied and mechanisms of their progress were proposed. Additionally, additive kinetic equations representing the course of reactions were proposed, with a mean square deviation of no more than 3%. Mathematical modelling was employed to create a representation of the reactors used in the process of obtaining acetone through the catalytic hydration of acetylene.

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Rezyume: Asetilennning gidratlanish jarayonini sanoatda amalga oshirish (birinchi marta Germaniyada 1916 yilda) munosabati bilan metallokompleks katalizatorlarni, ayniqsa simobsizlarini, o'rganishga katta ahamiyat berildi. Asetilendan aseton sintezi uchun katalizatorning tayyorlash usulini o'zgartirib va unga promotor sifatida turli xil d-elementlarning tuzlarini qo'shib ko'rildi. Katalizator ikki usulda cho'ktirish va yuttirish usullarida tayyorlandi. Yangi yuqori samaradorlikka ega bo'lgan nanokatalizatorlarning ishlatilishi sanoatda jarayonlar va texnologiyalarning ekologik xarakteristikalarining yaxshilanishiga, atmosferaga tashlanadigan zararli chiqindilarning kamayishiga, muqobil energoresurslarning ekologik toza turlarini, yangi mahsulot va materiallar yaratishga olib keladi.

Резюме: В связи с промышленным внедрением процесса гидратации ацетилена (впервые в Германии в 1916 г.) большое значение придавалось изучению металлокомплексных катализаторов, особенно безртутных. Была предпринята попытка изменить способ приготовления катализатора синтеза ацетона из ацетилена и добавить к нему в качестве промотора соли различных d-элементов. Катализатор готовили двумя способами: осаждением и абсорбцией. Использование новых высокоэффективных нанокатализаторов приводит к улучшению экологических характеристик процессов и технологий в промышленности, снижению вредных выбросов в атмосферу, созданию экологически чистых видов альтернативных энергоресурсов, новых продуктов и материалов.

Kalit so'zlar: "Ho'l" va suspendirlash, aseton, asetilen, suv, HCT, nanokatalizator, bentonit.

Ключевые слова. «мокрые» и суспензии, ацетон, ацетилен, вода, ЯКС, нанокатализатор, бентонит.

BIOLOGICAL BASIS FOR INTEGRATED CONTROL OF TERMITES OF THE GENUS ISOPTERA, ANACANTHOTERMS

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Summary: *Termites (Isoptera, (Brullé, 1832)) are considered a real scourge in all tropical and warm countries, examples of which are the destruction of dwellings, furniture, clothing and footwear, desiccation of various wild plants, trees and conifers, irrigation canals, piers, suffice it to show that barges, dams and ulems are destroyed by water pressure due to thinning due to termite damage. Termites also cause complete destruction of books stored in many archives and libraries.*

Key words: *Uzbekistan, termites, anacanthotherms, plants, insects, tropical, individuals.*

1. INTRODUCTION.

Representatives of the insect order termites (Isoptera, (Brullé, 1832)) are very widespread in nature, living in communities in various ecological environments associated with soil. Currently, more than 2900 species of termites are known, of which 120 species are classified as pests. Termites are a veritable scourge in all tropical and warm countries, such as destruction of dwellings, furniture, clothes and shoes, wilting of various wild plants, trees and conifers, thinning of irrigation canals, wharves, barges, dams and ulems due to termite damage is enough to show that it crumbles under water pressure. Termites also cause complete destruction of books stored in many archives and libraries.

Termites are insects that live in highly developed communities. In this respect, they have much in common with ants and bees. They live in a nest built on the ground or in special devices, forming a large community of many thousands of individuals. Termites in a community are made up of several phases and classes, which consist of workers, soldiers and sexual individuals that differ in appearance and function. The pair of individuals in a nest is a male and female termite, commonly referred to as the "king" and "queen". In the Central Asian republics, termites are known to inhabit mainly steppes and semi-deserts and foothills.

2 species belonging to the genus *Anacanthotermes*: *Turkestan* and large Caspian termites (*A.turkestanicus* Jacobs., *A.ahngerianus* Jacobs.) are widespread in Uzbekistan, especially in the next 20-30 years in almost all regions of our republic and in the republic. Karakalpakstan, households, agriculture, causing great damage to buildings and even historical monuments. The nest of *Turkestan* termites is often hidden underground, not far from buildings, and is almost invisible from the outside. They build paths along the walls of the building and congregate in the warm winter and cool summer rooms of the building. The nest of the large Caspian termite is slightly higher than the ground surface and consists of a complex system of horizontal and vertical slits, chambers and corridors [1:2:3:5].

The first step in developing biological control measures for termites is to identify pathogenic entomopathogenic microorganisms and study their pathogenic properties. Among entomopathogenic microorganisms, the effects of bacteria, fungi and nematodes on termites have been studied to some extent. However, there are few studies on the practical use of entomopathogenic microorganisms against termites. In view of the above, it is necessary to develop a new, environmentally friendly, highly effective technology for termite control.

2. MATERIALS AND METHODS.

Necessary materials for the research work were collected from the Koyi-Amudarya State Biosphere Reserve in natural conditions of Karakalpakstan of the Republic of Uzbekistan, from the historical museum of Ichan Castle of Kegaila district in anthropogenically transformed places, as well as from the Juma Reserve. Mosque, monument to Pahlavon Mahmud, Khiva city, Khorezm region. Attention was paid to 2 species of the genus *Anacanthotermes* in Uzbekistan: *Turkestan* and

large Caspian termites (*A. turkestanicus* Jacobs., *A. ahngerianus* Jacobs.). In addition, the location of nests of termites belonging to the genus *Anacanthotermes* and isolation of microorganisms from their bodies during pest control were carried out. Also in the conditions of Uzbekistan A.A. The biological efficacy of *Beauveria tenella* VD-85 strain isolated from Asian locust (*Locusta migratoria*) (Patent No. IDP 04692 dated 23.03.2001) was studied by Nurzhanov et al. [4].

3. RESULTS AND DISCUSSION.

In order to study the action of antimicroorganisms against termites of the genus *Anacanthotermes*, microorganisms belonging to different taxonomic groups were isolated from termites. From different regions of our republic 155 diseased and dead termite species were isolated and mycologically analysed, 111 of them, including 12 *Aspergillus niger*, 5 - *Alternaria* sp., 25 - *Beauveria tenella*, 12 - *Penicillium* sp., 46 - *Mucor* sp. , 4 - *Actinomycetes* sp. are separated. At the same time, *B. tenella* + *Mucor* sp. , 2 - *B. tenella* + *Penicillium* sp. were also observed fungal compounds. In addition, the plants eaten by termites as food are stems of sunflower (*Helianthus annuus* L.) and technical sorghum (*Sorghum technicus* Rosher.), and the visible black spot fungus belongs to the family Dematiaceae: *Alternaria alternata* (Fr.) Keissler. , *Cladosporium herbarum* (Pers.) Lk, *C. brevi-compactum* Pidopl. et Deniak, *Helminthosporium* sp., *Semphylium botryosum* Wallr., *S.ilicis* Tengwal. species and the family Moniliaceae (*Mucedinaceae*), *Aspergillus sulphureus* (Fr.) Thom et Church, *A.niger* v. Tai, *A. terreus* Thom, *Cephalosporium* sp., *Penicillium* sp. species of *Fusarium* sp of the family Tuberculariaceae. and *Mucor hiemalis* of the class Phycomycetes, *Rhisopus nigricans* Her. types were separated (Table 1).

Table 1
Mycobiota of plants that termites consume as food

№	Types of mushroom	Industrial maize	Sunflower
1.	<i>Alternaria alternata</i>	+++	+
2.	<i>Aspergillus sulfurous</i>	+	+
3.	<i>A.niger</i>		+
4.	<i>A.terreus</i>	+	
5.	<i>Cephalosporium</i> sp.		+
6.	<i>Cladosporium brevi-compactum</i>	++	+
7.	<i>Cladosporium herbarum</i>	++	
8.	<i>Fusarium</i> sp.	+	
9.	<i>Mucor hiemalis</i>	+	
10.	<i>Penicillium notatum</i>	+	++
11.	<i>Penicillium</i> sp.		++
12.	<i>Rhisopus nigricans</i>	+	
13.	<i>Stemphylium botryosum</i>	+	
14.	<i>S.ilicis</i>		+
15.	<i>Helminthosporium</i> sp.	++	+

Note: occurrence of fungi +++ frequent, ++ average, + rare.

The pathogenicity of fungal species isolated from termites and food plants against termites was studied in laboratory conditions. The results show that most of the fungi of the studied groups are not highly pathogenic for termites.

2 species belonging to the genus *Anacanthotermes*: fungi isolated from termites of Turkestan and the Greater Caspian Sea (*A.turkestanicus* Jacobs., *A.ahngerianus* Jacobs.) and *Beauveria tenella* VD-85 strain isolated from Asian locust (*Locusta migratoria*) were tested for biological biological biological value. Efficacy against termites: strain *tenella* VD-85 was highly virulent in termite workers (Fig. 1).

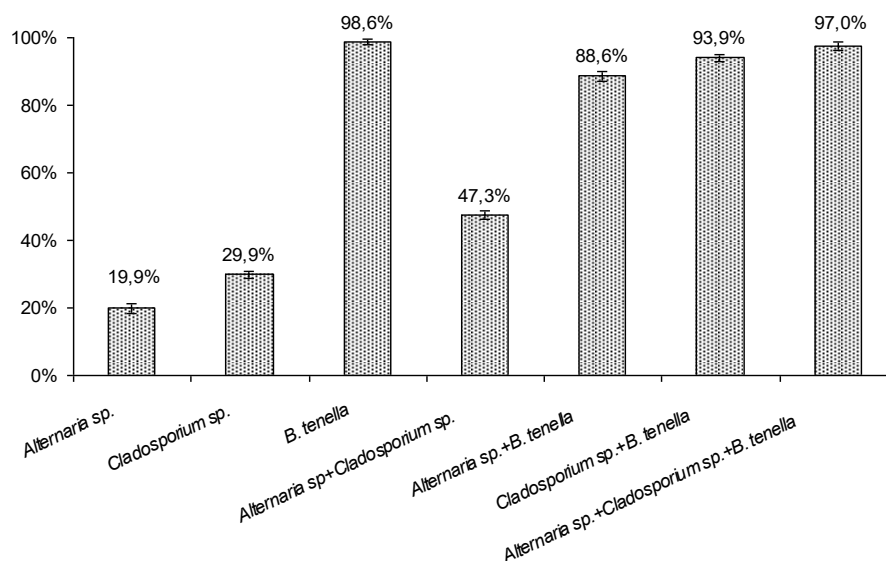


Figure 1: Biological efficacy of fungi against termites of the genus Anacanthotermes.

According to the results of the study, when the spores of the fungus were tested as food for termites, 98.6% of termites died when they were fed sunflower stalks mixed with spores of *B. tenella* fungus for 10 days in laboratory conditions. For the other fungi, these figures were 19.9-29.9%. At the same time, the efficiency reached 88.6-97.0% when *B. tenella* was mixed with spores of fungi of low pathogenicity. Thus, *Alternaria* sp. 19.9%; *Cladosporium* sp. 29.9%; *Alternaria* sp.+*Cladosporium* sp. affected 47.3%, due to their very low pathogenicity, their use in developing an integrated control system is inappropriate. In the experiment, 30 worker termites were taken for each variant. In the control variant termites were not infected and turned into corpses.

In conclusion, microorganisms-fungi isolated from the mycobiota of plants used by termites of 2 species of the genus *Anacanthotermes*: *Turkestan* and large Caspian termites (*A. turkestanicus* Jacobs., *A. ahngerianus* Jacobs.) were not susceptible to the pest, isolated from the Asian locust (*Locusta migratoria*) the VD-85 strain of the fungus *Beauveria tenella* was known for its high biological efficacy.

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Rezyume: *Termitlar (Isoptera, (Brullé, 1832)) barcha tropik va issiq mamlakatlarda haqiqiy ofat hisoblanadi, bunga misol sifatida turar-joylar, mebellar, kiyim-kechak va poyabzallarni vayron qilish, turli yovvoyi o'simliklar, daraxtlar va ignabargli daraxtlarni quritish, sug'orishdir. kanallar,*

iskalalar, barjalar, to'g'onlar va ulemlarning termitlarning shikastlanishi tufayli suyultirilganligi sababli suv bosimi bilan vayron bo'lishini ko'rsatish kifoya. Termitlar, shuningdek, ko'plab arxiv va kutubxonalarda saqlanadigan kitoblarni butunlay yo'q qilishga olib keladi.

Резюме: Термиты (Isoptera, (Brullé, 1832)) считаются настоящим бичом во всех тропических и теплых странах, примерами которого являются разрушение жилищ, мебели, одежды и обуви, усыхание различных дикорастущих растений, деревьев и хвойных пород, орошение каналов, пирсов достаточно, чтобы показать, что баржи, плотины и улемы разрушаются давлением воды из-за истончения из-за повреждения термитами. Термиты также вызывают полное уничтожение книг, хранящихся во многих архивах и библиотеках.

Kalit so'zlar: O'zbekiston, termitlar, anakantotermlar, o'simliklar, hasharotlar, tropiklar, individlar.

Ключевые слова: Узбекистан, термиты, anakantотермные животные, растения, насекомые, тропики, особи.

UDC 519.6

PROPERTIES OF SOLUTIONS TO THE SALT TRANSFERENCE PROBLEM WITH CONVECTIVE TRANSFERENCE AND ABSORPTION

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Summary: This paper qualitatively investigates the nonlinear model of diffusion, filtration, and salt concentration in a heterogeneous medium, based on comparison theorems. The property of localization of the solution of the nonlinear reaction-diffusion model with double nonlinearity for media with variable density is established by constructing a solution of the Zeldovich-Barenblatt type. It is established that the cause of these new phenomena is nonlinearity, the action of convective transport, the speed of which depends on time, and the presence of absorption.

Key words: Convective transference, self-similar solution, absorption.

Properties of solutions to the reaction-diffusion problem with double nonlinearity with convective transport and absorption

We consider $Q = \{(t, x) : t > 0, x \in R^N\}$ the Cauchy problem for a parabolic equation with double nonlinearity with convective transport and absorption

$$Au \equiv -\frac{\partial u}{\partial t} + \nabla \left(u^{m-1} |\nabla u^k|^{p-2} \nabla u \right) - \operatorname{div}(c(t)u) + \varepsilon \gamma(t) u^\beta = 0, \quad (1)$$

$$u|_{t=0} = u_0(x) \geq 0, \quad x \in R^N, \quad (2)$$

where $\beta > 0$, n , p , m – specified parameters, $\nabla(\cdot) = \operatorname{grad}(\cdot)$, $0 < \gamma(t) \in C(0, \infty)$, $\varepsilon = \pm 1$. If $\varepsilon = -1$, then the process is absorption; if it equals $+1$, then it is a source.

This problem in $\gamma(t) = 1$, $p = 2$, $m \geq 1$ the case is studied in detail in [6, 7, 8], and $\gamma(t) = 1$, $k = m$, $m \geq 1$ in the case of various properties of solutions are studied in numerous papers [1-7].

Equation (1) describes a set of physical processes [1-16], for example, reaction – diffusion, thermal conductivity, polytrophic filtration of liquid and gas, salt transference in a nonlinear medium characterized by a nonlinear coefficient in the presence of convective transfer at a time-dependent rate, and absorption, whose power is equal $\gamma(t)u^\beta$.

A distinctive feature of the equation (1) is its degeneracy: in the region where $u = 0$ or $\nabla u = 0$, equation (1) is degenerate, which gives rise to certain difficulties both in the qualitative study of the properties of solutions and in its numerical solution. In the degeneration domain, the problem (1), (2) may not have a classical solution. Therefore, in this case, from a physical point of view, it is reasonable to consider generalized solutions, from the class of continuous, bounded and non-negative functions $0 \leq u(t, x)$ with a continuous flow: $u^{m-1} |\nabla u^k|^{p-2} \nabla u \in C(Q)$ and satisfying the following integral identity

$$\int_0^t \int_\Omega \left(-u \psi_t + u^{m-1} |\nabla u^k|^{p-2} \nabla \psi - c(t) u \nabla \psi - \gamma(t) u^\beta \psi \right) dx dt - \int_\Omega u_0(x) \psi(x, 0) dx = 0$$

for $\forall \psi(t, x) \in C_1^0(R^N \times [0, T])$, where $\Omega \in R^N$.

It is shown that before numerically solving and visualizing the processes described by equation (1), it is necessary to study the qualitative properties of solutions such as the final velocity of the perturbation propagation, localization of the solution, asymptotes of the solution, the behavior

of the free boundary depending on the values of the equation (1) and the initial distribution $u_0(x)$. The properties of solutions to the problem (1), (2) depend on the values of the equation (1) and the initial function. In [1-7] the properties of solutions in the special case of equation (1), when $\beta \geq 1$, $0 < \beta < 1$, $\gamma(t) = 1$, at $k = 1$ or $p = 2$, are well studied. They have different nonlinear effects depending on the parameter values [1-15].

It is shown below that in the case $k(p-2) + m - 1 > 0$, $\beta \geq 1$ there is a solution for which there is a finite velocity of propagation of perturbations (CSR).

To establish the properties of the solutions to the problem, self – similar and approximate self-similar approaches are used.

Construction of approximately self-similar and self-similar equation. Below the method of nonlinear splitting [1,2,3] is proposed a method of constructing a self-similar and approximate self-similar equation for the equation (1), which greatly facilitates the study of the qualitative properties of the solutions of the problem (1), (2).

For information, the equations (1) to the self-similar, approximately self-similar mind first by replacing

$$u(t, x) = z(t, \xi), \quad \xi = \int_0^t c(y) dy - x \quad (4)$$

we give (1) to the form

$$-\frac{\partial z}{\partial t} + \nabla_{\xi} \left(z^{m-1} \left| \nabla_{\xi} z^k \right|^{p-2} \nabla_{\xi} z \right) - \gamma(t) z^{\beta} = 0,$$

and then replacement

$$z(t, \xi) = \bar{u}(t) w(\tau(t), \xi), \quad (5)$$

where the function $\bar{u}(t) = \left[(T + (\beta - 1) \int_0^t \gamma(\eta) d\eta) \right]^{-1/(\beta-1)}$ is the solution of equation (1) without

its diffusion part $\frac{d\bar{u}}{dt} = -\gamma(t)\bar{u}^{\beta}$. We reduce the equation (1) can be written as

$$\frac{\partial w}{\partial \tau} = \nabla_{\xi} \left(w^{m-1} \left| \nabla_{\xi} w^k \right|^{p-2} \nabla_{\xi} w \right) + \gamma(t) \bar{u}^{\beta - (k(p-2) + m)} (w - w^{\beta}), \quad (6)$$

where functions $\tau(t)$ are defined as

$$\tau(t) = \begin{cases} \int [\bar{u}(t)]^{k(p-2) + m - 1} dt, & \text{if } k(p-2)m - 1 \neq 0, \\ T + t, & \text{if } k(p-2)m - 1 = 0. \end{cases}$$

Note that since for the main part of the equation (6) its radially symmetric solutions $w(\tau(t), |\xi| = r)$ have the form

$$\frac{\partial w}{\partial \tau} = r^{1-N} \frac{\partial}{\partial r} \left(r^{N-1} w^{m-1} \left| \frac{\partial w^k}{\partial r} \right|^{p-2} \frac{\partial w^l}{\partial r} \right), \quad (7)$$

the supplying of (5) in (6), we have the equation

$$\frac{\partial w}{\partial \tau} = r^{1-N} \frac{\partial}{\partial r} \left(r^{N-1} w^{m-1} \left| \frac{\partial w^k}{\partial r} \right|^{p-2} \frac{\partial w^l}{\partial r} \right) + \gamma(t) \bar{u}^{\beta - (k(p-2) + m + l - 1)} (w - w^{\beta}). \quad (8)$$

In this case $\beta = k(p-2) + m + l - 1$, if the equation (8) takes the form

$$\frac{\partial w}{\partial \tau} = r^{1-N} \frac{\partial}{\partial r} \left(r^{N-1} w^{m-1} \left| \frac{\partial w^k}{\partial r} \right|^{p-2} \frac{\partial w^l}{\partial r} \right) + \gamma(t) (w - w^\beta).$$

Further believing

$$w(\tau, x) = f(\eta), \quad \eta = |\xi| / [\tau(t)]^{\frac{1}{p}} \quad (9)$$

it can be easily seen that when $\beta = k(p-2) + m + l - 1$ the function $f(\eta)$ satisfies the approximate self-similar equation

$$\eta^{1-s} \frac{d}{d\eta} \left(\eta^{s-1} f^{m-1} \left| \frac{df^k}{d\eta} \right|^{p-2} \frac{df^l}{d\eta} \right) + \frac{\eta}{p} \frac{df}{d\eta} + \gamma(t) \tau(t) (f - f^\beta) = 0. \quad (10)$$

In the case where

$$\gamma(t) \tau(t) [\bar{u}(t)]^{\beta - (k(p-2) + m)} = c_0, \quad (11)$$

where c_0 he constant, then (8) turns into a self-similar equation

$$\eta^{1-s} \frac{d}{d\eta} \left(\eta^{s-1} f^{m-1} \left| \frac{df^k}{d\eta} \right|^{p-2} \frac{df^l}{d\eta} \right) + \frac{\eta}{p} \frac{df}{d\eta} + c_0 (f - f^\beta) = 0. \quad (12)$$

For example, in the particular case where $\gamma(t) = (T + t)^\sigma$, where σ is a constant, it is easy

to calculate that in equation (12) $c_0 = \frac{(\sigma + 1)}{\beta - 1 - (\sigma + 1)(k(p-2) + m + l - 1)}$, the self-similar equation (12) has the following form:

$$\eta^{1-s} \frac{d}{d\eta} \left(\eta^{s-1} f^{m-1} \left| \frac{df^k}{d\eta} \right|^{p-2} \frac{df^l}{d\eta} \right) + \frac{(\sigma + 1)}{\beta - 1 - (\sigma + 1)(k(p-2) + m + l - 1)} \times \quad (13)$$

$$\times (f - f^\beta) = 0.$$

In this case

$$\tau(t) = \begin{cases} (T + t)^{p_2} / p_2, & \text{if } p_2 \neq 0, \\ T + t, & \text{if } p_2 = 0, \\ \ln(T + t), & \text{if } \beta = (\sigma + 1)(k(p-2) + m - 1), \end{cases} \quad (14)$$

where $p_2 = 1 - (\sigma + 1)(k(p-2) + m + l - 2) / (\beta - 1)$

The value $\beta = 1 - (\sigma + 1)(k(p-2) + m - 1)$ is a singular case of equation (13), the property of positive solution of which has been studied [15].

Various properties of generalized solutions of self-similar solutions equation (9) in the case when $p = 2$, with a boundary condition

$$f(0) = c \geq 0, \quad f(\infty) = 0, \quad (15)$$

$$f(0) = c \geq 0, \quad f(b) = 0, \quad b < \infty, \quad (16)$$

studied in [16] the properties of unbounded solutions and the existence of thermal structures are investigated, and the problems of numerical solutions are considered.

The condition of localization of the Cauchy problem solution. Now consider the instantaneous source problem for equation (1) for the case where $\beta = 1$, $\gamma(t) \neq 0$,

$u_0(x) = q\delta(x)$, where q is the instantaneous source power and $\delta(x)$ is the Dirac Delta function. By the exact solution of the problem (1), (2) we show the localization condition of the solution.

In this case, the problem (1), (2) has the following exact self-similar solution

$$u(t, x) = \bar{u}(t) [\tau(t)]^{-\frac{N}{p+(k(p-2)+m+l-2)N}} \bar{f}(\eta) \quad (17)$$

$$\bar{f}(\eta) = \begin{cases} \left(a - |\eta|^{p/(p-1)} \right)_+^{(p-1)/(k(p-2)+m+l-2)}, & \text{if } k(p-2)+m+l-2 \neq 0, \\ \exp \left(-\frac{1}{lk^{p-2}} \left(\frac{\eta}{p} \right)^p \right), & \text{if } k(p-2)+m+l-2 = 0, \end{cases} \quad (18)$$

where

$$\eta = |\xi| [\tau(t)]^{-\frac{1}{p}}, \quad (a)_+ = \max(0, a), \quad (19)$$

and the constant a in (19) is found from the condition

$$\int_{R^N} u(t, x) dx = q. \quad (20)$$

Note that from solution (18) at $p = 2$, $T = 0$ when

$$u_0(x) \neq q\delta(x),$$

get the solution of the Zeldovich-Kompaneetz-Barenblatt [18].

We now show a method of constructing a solution (18).

To get the exact solution of the equation (1) for $\beta = 1$, let's do in (1) replacement

$$u(t, x) = \bar{u}(t) w(\tau(t), \xi), \quad \xi = \int_0^t c(y) dy - x, \quad (21)$$

where

$$\tau(t) = \int_0^t [\bar{u}(t)]^{k(p-2)+m+l-2} dt, \quad \bar{u}(t) = \exp \left(-\int_0^t \gamma(\eta) d\eta \right) \quad (22)$$

is the solution of the equation

$$\frac{d\bar{u}}{dt} = -\gamma(t)\bar{u}. \quad (23)$$

Then it is easy to see that equation (1) after replacing (21) and choosing $\tau(t)$, $\bar{u}(t)$ according to (22), (23) becomes

$$\frac{\partial w}{\partial \tau} = \nabla_\xi \left(w^{m-1} \left| \nabla_\xi w^k \right|^{p-2} \nabla_\xi w^l \right). \quad (24)$$

The solution of the Zeldovich-Barenblatt type has the form

$$w(\tau(t), \xi) = [\tau(t)]^{-\frac{N}{p+(k(p-2)+m+l-2)N}} \bar{f}(\eta).$$

Then taking into account the replacement (21) we have (18). Hence, it is thus proved

Theorem 1. Let and $\bar{u}(t) < +\infty$, $\forall t > 0$ и $\tau(\infty) < +\infty$. Then there is a localization of the solution of the problem (1), (2), if

$$u_0(x) \leq \bar{u}(0) \bar{f}(\xi) \Big|_{t=0}.$$

Proof. From the exact expression of the solution of equation (1) obtained above according to the principle of comparison $\beta = 1$, if we take the function as compared

$$z(t, x) = \bar{u}(t) [\tau(t)]^{-\frac{N}{p+(k(p-2)+m+l-2)N}} \bar{f}(\eta),$$

to solve the problem (1), (2) we have an estimate of

$$u(t, x) \leq z(t, x),$$

in the field $Q = \{(t, x) : t > 0, x \in R^N\}$.

Then for the front have a rating

$$\left| \int_0^t c(y) dy - x \right| \leq (a)^{(p-1)/p} [\tau(t)]^{1/p}, \quad (25)$$

that by virtue of the condition of theorem 1 means localization of the solution in the hypersphere

with radius $(a)^{(p-1)/p} [\tau(t)]^{1/p}$ and center $\int_0^t c(y) dy$. Theorem 1 is proved.

Theorem 2. Let the $u(t, x)$ generalized solution of the problem (1), (2) without the absorption term and the condition $u_0(x) \leq u_+(0, x)$,

Where $u_+(t, x) = \bar{f}(\eta)$, the function $\bar{f}(\eta)$ given by the formula (13). Then for the generalized solution of $u(t, x)$ the problem (1), (2) the following estimates for the solution and the free boundary take place

$$u(t, x) \leq u_+(t, x) \text{ in } Q, \text{ and } \left| \int_0^t c(y) dy - x \right| \leq (a)^{(p-1)/p} (T+t)^{1/p}, \quad x \in R^N, t > 0. \quad (26)$$

Proof. The proof of theorem 2 is based on comparison theorem of the solution [18]. In our case, the function $u_+(t, x) = \bar{f}(\eta)$, $\eta = |x| / (T+t)^{1/p}$. defined by the above formula (19) is taken as compared

It is easy to see that $Au_+(t, x) \leq 0$, in the domain $D_1 = \{(t, x) : t > 0, |x| < l_1(t)\}$,

$$l_1(t) = \left(\frac{a}{b} \right)^{(p-1)/p} [T + \tau(t)]^{1/p}, \quad T > 0. \text{ Then by virtue of the condition of theorem 1 on the basis}$$

of the solution comparison theorem [18] we have

$$u(t, x) \leq u_+(t, x) \text{ in area } Q.$$

Theorem 2 is proved.

The results below are relevant to the case $\beta > 1$.

Theorem 3. Assume that condition

$$\gamma(t) \tau(t) [\bar{u}(t)]^{\beta-(k(p-2)+m+l-1)} < \frac{N}{p}, \quad t > 0, \quad u_0(x) \leq z_+(0, x), \quad x \in R^N.$$

Then there is a global solution to the Cauchy problem (1) (2) for which an estimate in the domain Q takes place

$$u(t, x) \leq z_+(t, x) = \bar{u}(t) \bar{f}(\eta),$$

and for the free boundary, the estimate $|\xi| \leq \left(\frac{a}{b} \right)^{(p-1)/p} [T + \tau(t)]^{1/p}$, $x \in R^N$, $t > 0$, where

$z_+(t, x)$, $\bar{u}(t)$, $\bar{f}(\eta)$, $\tau(t)$ is the functions defined above.

Consequence. Let $\gamma(t) = \gamma = const$, $u_0(x) \leq z_+(0, x)$, $x \in R^N$,

$$\beta > k(p-2) + m + l - 1 + \frac{p}{N} \quad \text{and} \quad a^{\frac{(p-1)(\beta-1)}{k(p-2)+m-1}} < \frac{N}{p} - \frac{1}{\beta - (k(p-2) + m - 1)}. \quad (27)$$

Then the problem (1), (2) has a global generalized solution for which the evaluation takes place

$$u(t, x) \leq z_+(t, x).$$

In particular, this consequence implies the condition of global solvability given in [18]. This result, in the case when in equation (1), $m = 1$, $p = 2$ was obtained for the first time by Fujita [16] and is now called the critical exponent of Fujita type. In the case $k = 1$, $p = 2$ of the existence of global solutions is proved Samarskii A. A., Kurdyumov S. P., by Galaktionov V. A., Mikhailov A. P. [19], and in the case when $k = 1$, $m = 1$.

The solution estimate (27) shows that the closer the value β is to the critical value of the Fujita type $\beta = \beta_* = k(p-2) + m + l - 1 + p/N$, the smaller $u(t, x) \leq z_+(t, x)$ the initial value must be to fulfill the inequality.

The proofs of these theorems and other statements for solutions of the problem (1)-(2) are based on the nonlinear splitting method [14], the solution comparison theorem [18] and using the fact that the function $\bar{f}(\eta)$ defined above is the classical solution of the equation

$$L_1(m, p, N) \bar{f} + \frac{N}{p} \bar{f} = 0$$

$$\text{in the area } |\eta| < \left(\frac{a}{b}\right)^{\frac{p-1}{p}}, \text{ where } L_1(p, m, N) f = \eta^{1-N} \frac{d}{d\eta} \left(\eta^{N-1} f^{m-1} \left| \frac{df^k}{d\eta} \right|^{p-2} \frac{df^l}{d\eta} \right).$$

Note that the function $\bar{f}(\eta)$ satisfies the following conditions

$$0 \leq \bar{f}(\eta), \quad \eta^{1-N} \bar{f}^{m-1} \left| \eta^{N-1} \frac{d\bar{f}^k}{d\eta} \right|^{p-2} \frac{d\bar{f}^l}{d\eta} \in C[0, \infty).$$

Asymptotics of self-similar solutions. Note that when in (1) $\gamma(t) = \gamma > 0$ the equation (9) becomes self-similar:

$$\eta^{1-N} \frac{d}{d\xi} \left(\eta^{N-1} \left| \frac{df}{d\eta} \right|^{p-2} \frac{df^l}{d\eta} \right) + \frac{\eta}{p} \frac{df}{d\eta} + \frac{1}{\beta - (k(p-2) + m + l - 1)} (f - f^\beta) = 0. \quad (28)$$

Let us now consider this equation with the boundary condition

$$f(0) = c > 0, \quad f(d) = 0, \quad d < \infty. \quad (29)$$

Introduce the function

$$\bar{f}(\eta) = \left(a - \eta^{\frac{p}{p-1}} \right)_+^{\frac{p-1}{k(p-2)+m-1}}.$$

The existence of a generalized solution of the problem (28), (29) when in (1), $N = 1$, $p = 2$ was proved in [1-3].

Theorem 4. Let $k(p-2) + m + l - 2 > 0$, $\beta > 1$, $\beta > k(p-2) + m + l - 1$. Then the solution of the problem (28), (29) at $\eta \rightarrow \infty$ ($\eta = -\ln(a - b\xi^{p/(p-1)})$) has asymptotics

$$f(\xi) = c_1 \bar{f}(\xi)(1 + o(1)), \quad a = c^{\frac{k(p-2)+m+l-2}{p-1}},$$

where is determined from the solution of an algebraic equation

$$\frac{p(p-1)^{p-2}}{k(p-2) + m + l - 2)^p} c_1^{k(p-2)+m-1} - \left(\frac{1}{p}\right)^{p-1} \left(\frac{1}{(k(p-2) + m + l - 2)^p}\right) - \frac{(1/p)^{p-1}}{\beta - (k(p-2) + m + l - 1)} = 0. \quad (30)$$

Proof. To prove theorem 4 and (28), we make a replacement

$$f(\xi) = \bar{f}(\xi)W(\eta), \quad \eta = -\ln\left(a - \xi^{\frac{p}{p-1}}\right).$$

Then the equation (30) takes the following form

$$\frac{d}{d\eta} LW + \left(\frac{e^{-\eta}}{a - e^{-\eta}} N - \frac{pb_1}{p-1}\right) LW + \left(\frac{e^{-\eta}}{a - e^{-\eta}} N - \frac{pb_1}{p-1}\right) LW + \frac{1}{p} \left(\frac{p-1}{p}\right)^{p-2} \times$$

$$\times \left(\frac{dW}{d\eta} - b_1 kW^k\right) + \frac{((p-1)/p)^{p-1}}{\beta - (k(p-2) + m + l - 1)} \frac{e^{-\eta}}{a - e^{-\eta}} \left(W - e^{\frac{-(p-1)(\beta-1)\eta}{k(p-2)+m+l-2}} W^\beta\right) = 0,$$

where $b_1 = \frac{p-1}{k(p-2) + m + l - 2}$, $LW = W^{m-1} \left| \frac{dW}{d\eta} - kb_1 W^k \right|^{p-2} \left(\frac{dW}{d\eta} - kb_1 W^k \right).$

From here it is easy to see that $W \rightarrow c_1$ at $\eta \rightarrow \infty$, where constant c_1 defined from the solution of the algebraic equation

$$\frac{(p-1)^{p-2} p}{(k(p-2) + m + l - 2)^p} c_1^{k(p-2)+m-1} - \left(\frac{1}{p}\right)^{p-1} \left(\frac{1}{(k(p-2) + m + l - 2)^p}\right) - \frac{(1/p)^{p-1}}{\beta - (k(p-2) + m + l - 1)} = 0.$$

Theorem 4 is proved.

Case of fast diffusion. The case $k(p-2) + m + l - 2 < 0$ is called the case of fast diffusion. Now consider this case and the equation (28) with the boundary condition

$$f(0) = c > 0, \quad f(\infty) = 0. \quad (31)$$

Below we investigate the asymptotics of solutions to the problem (28), (31).

Consider the function

$$\tilde{f}(\xi) = (a + \xi^{p/(p-1)})^{(p-1)/(k(p-2)+m+l-2)}.$$

Theorem 5. If $p + b_1 N < 0$, $k(p-2) + m + l < 2$. Then the solution of the problem (28), (31) at $\xi \rightarrow \infty$ has asymptotic

$$f(\xi) = c_2 \tilde{f}(\xi)(1 + o(1)),$$

where is the solution of the equation

$$c_2^{k(p-2)+m-1} + b_1 \left(\frac{1}{p} \right)^{p-1} + \frac{b_1^2 (1/p)^{p-1}}{\beta - (k(p-2) + m + l - 1)} = 0,$$

where $b_1 = k(p-2) + m + l - 2$.

Proof. To prove the equation (28) we make a replacement

$$f(\xi) = \tilde{f}(\xi)W(\eta), \quad \eta = \ln(a + \xi^{p/(p-1)}). \quad (32)$$

Then it will be rewritten as

$$\begin{aligned} \frac{d}{d\eta} L_1(w) + \left(\frac{p}{b_1} + \frac{e^\eta}{e^\eta - a} N \right) L_1(W) + \frac{1}{p} \left(\frac{p-1}{p} \right)^{p-2} \left(\frac{dW}{d\eta} + \frac{p-1}{b_1} W \right) + \\ + \frac{((p-1)/p)^{p-1}}{\beta - (k(p-2) + m + l - 1)} \frac{e^\eta}{e^\eta - a} \left(W - e^{\frac{(p-1)(\beta-1)\eta}{b_1}} W^\beta \right) = 0, \end{aligned} \quad (33)$$

$$\text{where } L_1(w) = W^{m-1} \left| \frac{dW}{d\eta} + \frac{p-1}{b_1} W \right|^{p-2} \left(\frac{dW}{d\eta} + \frac{p-1}{b_1} W \right).$$

The analysis of the solutions of this equation at $\eta \rightarrow \infty$ shows that $W \rightarrow c_2$ at $\eta \rightarrow \infty$ and it must satisfy the algebraic equation (33).

Theorem 5 is proved.

Note. When $\beta = \frac{p - [k(p-2) - m + l - 1]}{p-1}$ the equation (33) has an exact solution

$$f(\xi) = A \left(a - \xi^{p/(p-1)} \right)_+^{\frac{p-1}{(k(p-2)+m+l-2)}},$$

where

$$\begin{aligned} A^{m+p-3} &= \frac{1}{p} \left(\frac{b_1}{p} \right)^{p-1} (p + b_1 N)^{-1}, \quad b_1 = k(p-2) + m + l - 2 > 0, \\ a &= \frac{p-1}{p(m-2)-1} \frac{(p(p + b_1 N))^{p/(p-1)}}{p^2(p + b_1 N)}. \end{aligned}$$

Other exact solution

$$f(\xi) = f(\xi) = A \left(a + \xi^{p/(p-1)} \right)^{\frac{p-1}{(k(p-2)+m+l-2)}}.$$

Note that in this case it is proved that the finite solutions of the problem (28), (29) have the same asymptotics as in theorem 5, but with a coefficient equal to 1.

Applying the comparison theorem, from [4] we obtain the necessary estimate for the free boundary.

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Rezyume: Ushbu maqolada, solishtirish teoremlari asosida, nochiziqli muhitda tarqalish, filtrlash, tuz konsentratsiyasining nochiziqli modeli sifati jihatdan tadqiq qilinadi. Ózgaruvchan ikki karra nochiziqli reaksiya-diffuziya modeli yechiminig lokalizatsiya xossasi Zeldovich-Barenblatt turidagi yechim qurish orqali aniqlanadi. Olingan yangi effektlarining sababi nochiziqlilik, konvektiv kóchish harakati, vaqtga bog'liq bo'lgan tezlik va yutilishning mavjudligi ekanligi aniqlandi.

Резюме: В данной статье, на основе теорем сравнения, качественно исследуется нелинейная модель диффузии, фильтрации и концентрации соли в неоднородной среде. Свойство локализации решения нелинейной модели реакции-диффузии с двойной нелинейностью, устанавливается путем построения решения типа Зельдовича-Баренблатт. Установлено, что причиной этих новых явлений является нелинейность, действие конвективного переноса, скорость которого зависит от времени, и наличие поглощения.

Kalit so'zlar: Konvektiv kóchish, avtomodel echimlar, yutilish.

Ключевые слова: Конвективный перенос, авtomodelное решение, поглощение.

**ISSUES OF STUDYING THE FUNCTIONAL STATE OF THE BLOOD AND
CIRCULATORY SYSTEM OF THE POPULATION UNDER THE INFLUENCE OF
ENVIRONMENTAL FACTORS**

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Summary: *In this article, issues related to the study of the functional state of the blood and circulatory system of the population, especially women of reproductive age, in connection with the influence of the environment, are thoroughly researched. The article also comprehensively analyzes all aspects of the blood and circulatory system of women of this age.*

Key words: *population, settlements, blood, circulatory system, environment, reproductive age, region.*

Cardiovascular diseases (CVD) are one of the leading causes of death worldwide, especially in developed countries. Current projections indicate a continued increase in the incidence of CVD given the current aging population and the epidemic of chronic noncommunicable diseases [1]. Until recently, it was believed that women were not as susceptible to CVD as men. It was postulated that estrogens have cardioprotective properties and this explains the lower incidence of CVD in premenopausal women. However, over the past decades, new data have emerged regarding gender differences in the incidence and prevalence of CVD [2]. In modern clinical studies, paradoxical gender differences are observed, where women have less severe coronary artery stenosis and relatively preserved left ventricular function, but higher rates of myocardial ischemia and mortality compared to age-matched men [3]. In this regard, underestimation of the peculiarities of the course of this pathology in women has recently been replaced by a significant increase in research on this problem. Until the last decades of the twentieth century, women of reproductive age were considered a vulnerable category of the population and were systematically excluded from clinical trials. This policy supported the tendency to use men as a standard and exclude women as problematic patients even when studying diseases affecting both sexes. Since the early 1990s, foreign research and funding institutions have made numerous efforts to promote wider involvement of women in biomedical research. Thus, the medical community has changed its policy and allowed women of childbearing age to participate in scientific research, significantly increasing the number of women eligible for inclusion in randomized clinical trials (up to 40%). Thus, it was revealed that gender differences affect the effectiveness of therapy. The latest reports of the cardiology community note a decrease in mortality from coronary heart disease (CHD). However, the mortality rate among women is lower than among men, and there is an increase in CVD mortality among young women. A recent study involving 8,592 middle-aged patients (49.2 ± 12.7 years) revealed a higher risk of developing atrial fibrillation (AF) and chronic heart failure (CHF) with preserved ejection fraction in women compared to men. The relationship between increased arterial stiffness and mortality in women was also 2 times higher, and acute coronary syndrome (ACS) with non-occluded coronary arteries also develops significantly more often in women. Thus, it is obvious that there are gender differences in the incidence and course of CVD. The circulatory system is an extensive network of organs and vessels that is responsible for the flow of blood, nutrients, hormones, oxygen, and other gases into and out of cells. Without a circulatory system, the body cannot fight disease or maintain a stable internal environment [Agajanian et al., 2006]. The cardiovascular system is a system that transports nutrients, respiratory gases, and metabolic products throughout the life of the organism, which allows for communication between different tissues [Shephard, 1994].

Functionally, there are arterial and venous networks of the cardiovascular system, which provide the movement of oxygenated and deoxygenated blood, respectively. Blood that contains oxygen is transported from the heart through the aorta to all parts of the body. Deoxygenated blood

occurs after oxygen is released from the blood and used by cells to obtain energy and waste products in the body [Warburton et al., 2002].

Recently, specialists have constantly turned to scientific research on the impact of unfavorable environmental factors on the female body, which leads to a violation of the physiological state of the reproductive function as the most vulnerable to such effects. Anthropogenic pollution of the biosphere plays a major role in reproductive disorders in women.

It is obvious that the impact on the reproductive sphere of women is multifactorial. Social, economic, physical, natural and climatic, and perhaps even cultural and ethnic reasons play an important role here. But one of the most important recently are environmental factors of external influence.

Research by specialists shows that the degree of influence of social and domestic factors is about 45%, while environmental factors account for 30-35% of the total ratio of various influences on the human body. They also note that in regions with the greatest environmental stress, the influence of negative exogenous factors becomes the strongest and accounts for more than 50% of the total content of causes of reproductive health disorders.

According to R.K.Amrin, E.S.Belozerev, I.M.Kulmanov (1991), the emergence of this technogenic biogeochemical province is associated with environmental changes in the SyrDarya River basin and the Aral Sea. Changes in the quantitative parameters and conditions of water supply, especially the growth of water mineralization, lead to an increase in infectious and non-infectious diseases. Among the population, there is a clearly expressed increase in the level of diseases of the endocrine and genitourinary systems of the body, digestive organs, blood and hematopoietic organs, the circulatory system, and oncological diseases. The sharp reduction in the water area of the Aral Sea led to a decrease in sea level and an increase in the mineralization of the water composition, pollution of the environment with various pollutants. Water mineralization increased from 1470 to 2800 mg/l, chlorides from 110 to 500 mg/l, sulfates from 292 to 1000 mg/l, ammonia from 0.5 to 1.3 mg/g, nitrites from 0.2 to 0.8 mg/l, nitrates from 1.6 to 15.4 mg/l. Ten chemical elements (sodium, potassium, calcium, lead, cadmium, nickel, cobalt, zinc, copper, iron) were detected in airborne dust, drinking water, plants, and the bodies of domestic animals. Among these pollutants of the internal environment of the body, mercury, cadmium, and lead pose the greatest danger. The highest concentration of these heavy metals was found in contaminated water and dust-ash waste and vegetation of the Aral Sea region (Zhanakorgan, Shielskiy, Syrdarya districts). All these chemical pollutants of the external environment gradually accumulate in the body, causing dysfunctions of the body.

Diseases of the circulatory system (DSC) are one of the main medical and social problems in urbanized areas due to high morbidity, disability and mortality. Given the multifactorial nature of the formation and development of diseases of the circulatory system, an important aspect of risk assessment is the determination of the structure of determining factors, including environmental ones.

Scientists have noted that the role of dust and gas mixtures in the development of pathological processes is confirmed by the results of our experimental studies. Thus, the biological effect of the main pollutant of atmospheric air in the study area, fly ash from solid fuel combined heat and power plants in the composition of the dust and gas mixture, with long-term chronic exposure in small doses, is characterized, along with the resorptive-toxic effect, by intensive generation and accumulation of active forms of oxygen, an increase in the content of lipid peroxides, a decrease in the activity of the antioxidant system and the formation of immunopathological processes.

Pathomorphological changes in the heart of experimental animals exposed to a dust and gas mixture were manifested by the development of inflammatory processes and dystrophic changes in the myocardium.

Numerous studies conducted among individuals living in areas with increased anthropo-geochemical load have proven a higher risk of developing both general morbidity and individual

nosological forms. This is also reflected in unfavorable demographic trends, as it is a factor in reducing life expectancy. The impact of air pollutants on the cardiovascular system (CVS) is currently being considered. An increase in the incidence and mortality from coronary heart disease (CHD) is noted, almost 2 times more often in men with more than 10 years of experience exposed to carbon disulfide at work. The most significant risk factor is atherogenic dyslipidemia; it has been established that in people living near chemical plants, the level of cardiovascular disease (CVD) is 2–4 times higher. A number of studies have examined the impact of chemical pollutants on the likelihood of developing not only chronic, but also acute forms of CHD.

A correlation was found between the incidence of myocardial infarction (MI) in people living near sources of organic pollutants, where the incidence by hospitalization was 20% higher, and the frequency of hospitalizations in people not exposed to organic pollutants.

The results of studies conducted by AR Hampel et al. and R Devlin et al. showed an acute effect of ozone on myocardial repolarization disorders according to electrocardiography (ECG). Studies conducted in London showed that an increase in the amount of pollutants in the atmosphere, especially with a sulfite component, in patients with an implanted cardioverter defibrillator led to an increase in the number of ventricular extrasystoles, atrial flutter and fibrillation.

An objective criterion for the health status of the population is the mortality rate, it characterizes the sanitary and epidemiological well-being of the entire population. According to the American Heart Association, an increase in the level of dust particles smaller than 2.5 microns for several hours a week can be the cause of death in patients with CVD, as well as the cause of hospitalization for developed MI and decompensation of heart failure. Similar data obtained in a study conducted in California and in a 12-year observation in China demonstrated that long-term exposure to dust particles, nitrogen oxide was not only a risk for the development of coronary heart disease, stroke, but also a predictor of cardiovascular and cerebrovascular mortality. Scientists and specialists in various fields believe it is necessary to carry out a set of systemic measures: legislative, regulatory, educational, organizational. To coordinate them, it is important to develop and adopt by law the concept of the program "Medical and environmental safety and health of the nation", which will allow monitoring and identifying cause-and-effect relationships in the development of environmentally conditioned diseases.

It is generally accepted that adequate hormonal status in premenopause provides cardioprotection, so the risk of developing CVD in women of this age group is lower. This is confirmed by modern studies, which have revealed some differences between men and women in the levels of activity of antioxidant enzymes associated with estrogen. This hypothesis is consistent with the results of experiments on laboratory animals, which found that oxidative stress was higher in female rats after castration compared to females in the control group, while there was no reliable difference in males after castration. Obviously, estrogen plays a complex role, and it is possible that its effect on oxidative stress is multifaceted and is not limited exclusively to cardioprotective effects. In this regard, early natural or surgical menopause is of particular importance. Thus, according to some data, the risk of developing coronary heart disease in women with surgical menopause increases by 7 times, and with early natural menopause - by 3 times. Thus, surgical menopause leads to the development of early and delayed estrogen deficiency disorders, united by the term "postovariectomy syndrome". The latter is characterized by the development of neurovegetative, psychoemotional and metabolic disorders and is associated with an increased risk of coronary heart disease.

A decrease in ovarian function leads to a decrease in the quality of life of women, since it causes the development of metabolic disorders and the summation of cardiovascular risk factors, such as a combination of obesity, arterial hypertension (AH) and dyslipidemia, potentially interrelated with hormonal-mediated metabolic disorders.

Currently, more and more attention is paid to the development of cardiovascular disorders in postmenopausal women. Over the past 30–40 years, the life expectancy of women has increased, and the age of menopause has increased accordingly. After menopause, more than half of women

experience weight gain, which leads to the development of menopausal metabolic syndrome (MMS). Its main manifestations are abdominal obesity, dyslipidemia, and carbohydrate metabolism disorders. The main clinical and laboratory indicators of MMS include: increased waist circumference (more than 88 cm), hypertriglyceridemia (more than 1.7 mmol/l), low high-density lipoprotein cholesterol (HDL) (less than 1.29 mmol/l), increased blood pressure (more than 130/85 mm Hg), increased fasting plasma glucose (more than 6.1 mmol/l) – the presence of these signs is sufficient to diagnose MMS.

MMS is a set of risk factors for the development of cardiovascular diseases (CVD) in postmenopausal women and is caused by estrogen deficiency, which serves as one of the triggers for the development of endothelial dysfunction and subsequent atherogenesis. Almost all metabolic disorders that occur after menopause are interconnected and further aggravate the adverse effects of sex steroid deficiency on the cardiovascular system. This is especially true for insulin resistance, which is considered a key sign of MMS and is almost always combined with abdominal obesity. It is known that female sex hormones control the metabolism of fats and carbohydrates in the body, accelerating the breakdown of fats and suppressing the synthesis of lipid fractions that contribute to the development of atherosclerosis. A gradual decrease in estrogen levels during perimenopause leads to atherogenic lipid metabolism disorders – a significant increase in the blood levels of total cholesterol, triglycerides and low-density lipoproteins (LDL) with a decrease in HDL and the development of insulin resistance, which causes a tendency to gain weight during menopause [8, 9]. Visceral adipose tissue has a direct effect on the liver and is metabolically more active than subcutaneous tissue; both lipogenesis and lipolysis processes occur in it. According to a number of researchers, direct entry of free fatty acids, as well as other biologically active substances secreted by visceral adipose tissue, into the liver is one of the pathogenetic mechanisms for the development of insulin resistance. As early as 1956, J. Vague noted a high frequency of CVD in patients with central abdominal obesity. Currently, the abdominal type of obesity is a component of the so-called MMS, or syndrome X. Studies have confirmed a strong correlation between the degree of development of visceral adipose tissue and waist circumference. Waist circumference of more than 100 cm at the age of up to 40 years and more than 90 cm at the age of 40–60 years in both men and women serves as an indicator of abdominal-visceral obesity. In contrast to general obesity, the visceral type of obesity in combination with other components of MMS is the most important predictor of CVD risk.

A waist-to-hip ratio in women greater than 0.85 indicates a distribution of adipose tissue that is unfavorable for the body, which usually leads to the development of metabolic disorders and a significant increase in the risk of CVD and diabetes mellitus (DM) even with normal body weight.

The mechanisms of magnesium deficiency are associated with the activation of oxidative stress in connective tissue, increased activity of proteolytic enzymes, and impaired proliferative, migratory, and adhesive characteristics of the endothelium. Due to its ability to stimulate NO synthesis and participation in platelet aggregation, magnesium affects endothelial function. It has been proven that magnesium deficiency increases thromboxane A₂ activity, which is known to be accompanied by endothelial damage and hypercoagulation. Ca²⁺:Mg²⁺ imbalance is the leading factor in the implementation of excessive thrombus formation against the background of magnesium deficiency, which affects erythrocytes and platelets. There is evidence of a relationship between magnesium deficiency and atherosclerosis. It has been shown that magnesium deficiency is associated with increased levels of total cholesterol, low-density lipids, triglycerides, decreased activity of lecithin-cholesterol aminotransferase and lipoprotein lipase, and increased activity of HMG-CoA reductase.

The most pronounced magnesium deficiency occurs in patients with increased levels of atherogenic lipids. Given the antiatherogenic effects of magnesium preparations, correction of its deficiency can also help slow the progression of coronary heart disease. The important role of magnesium deficiency in the development of metabolic syndrome is known, in particular in combination with high fructose consumption.

Regulatory acts on compulsory insurance of medical and environmental risks in the field of nature management and health are needed, in particular the law "On compulsory environmental insurance". It should reflect environmental liability insurance for the operation of hydraulic structures, oil and gas pipelines, chemical and radiochemical industry enterprises, other production facilities hazardous to public health, as well as the health and lives of employees, adults and children living within the radius of the facility, the source of environmental risk.

The studies have shown that in cities with a developed metallurgical industry, the adult population suffers from circulatory diseases 1.5 times more often, from digestive diseases 1.7 times more often, and skin and mucous membrane lesions of the eyes are noted three times more often. At the same time, the contribution of air pollution by air pollutants to the development of diseases of the bronchopulmonary system varies from 20 to 50%, and cardiovascular diseases - from 10.7 to 32.4%.

Thus, a cause-and-effect relationship is traced between the influence of environmental pollution and the development of multiple organ diseases, including the cardiovascular system. In this regard, protocols for the personalized implementation of targeted preventive and corrective medical and environmental measures require further study and development.

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Rezyume: *Ushbu maqolada aholi, ayniqsa reproduktiv yoshdagi ayollarning qon va qon aylanish tizimining funktsional holatini atrof muhitning ta'siri bilan bog'liq holda o'rganish bo'yicha masalalar atroflicha tadqiq qilingan. Maqola shuningdek ushbu yoshdagi ayollarning qon va qon aylanish tizimining barcha jihatlarini keng mazmunda tahlil qilingan.*

Резюме: *В данной статье подробно исследуются вопросы, связанные с изучением функционального состояния крови и системы кровообращения населения, особенно женщин репродуктивного возраста, в связи с влиянием окружающей среды. В статье также всесторонне анализируются все аспекты деятельности системы крови и кровообращения женщин этого возраста.*

Kalit so'zlar: *aholi, aholi yashash punktlari, qon, qon aylanish tizimi, atrof muhit, reproduktiv yosh, hudud.*

Ключевые слова: *население, населенные пункты, кровь, система кровообращения, окружающая среда, репродуктивный возраст, регион.*

UDK: 595.794/.799

HYMENOPTERA: ACULEATA FAUNA OF ARALKUM NATIONAL PARK

Saparov K.

Nukus state pedagogical institute named after Ajiniyaz

Summary: In the article is provided data on our research, conducted research in Aralkum National Park Reserve in 2021-2024. According to studies, 48 species belonging to 7 families, 14 subfamilies, and 32 genera of the Aculeata subfamily were distributed at different levels. Among them, *Ammophila heydeni*, *Cerceris straminea*, *Cataglyphis aenescens* species are common. In the Aralkum National Park, the most species of the Aculeata subfamily are distributed in the Yulgunzar (36 species), in the Saxaulzar (32 species), and in the Kandymzar (24 species) and in the low-altitude areas with mixed vegetation or sand, 16 species are the least common.

Key words: Aralkum, Aculeata, Apidae infraorder, generation, Yulgunzar, Saxaulzar, sugarcane.

Introduction. Aralkum National Park is located in Muynak Region of the Republic of Karakalpakstan and its total area is 1,000,000 hectares. This area is characterized by natural and climatic conditions, flora and fauna adapted to the desert ecosystem. Mainly in natural areas saxaul, yulgun trees and kandym are widely distributed. However, studies of the fauna of insects in this area have not been sufficiently studied to date. The purpose of this paper is a faunistic survey of the Aculeata Hymenoptera wasp fauna of Aralkum National Park Reserve.

Material and methods

In 2021-2024, research was conducted in different areas of Aralkum National Park Reserve (Fig. 1). Golub [Golub, 2012:339], Merick yellow plastic container [Moericke, 1951:24] and traditional entomological trap (sachok) methods were used to collect the materials.

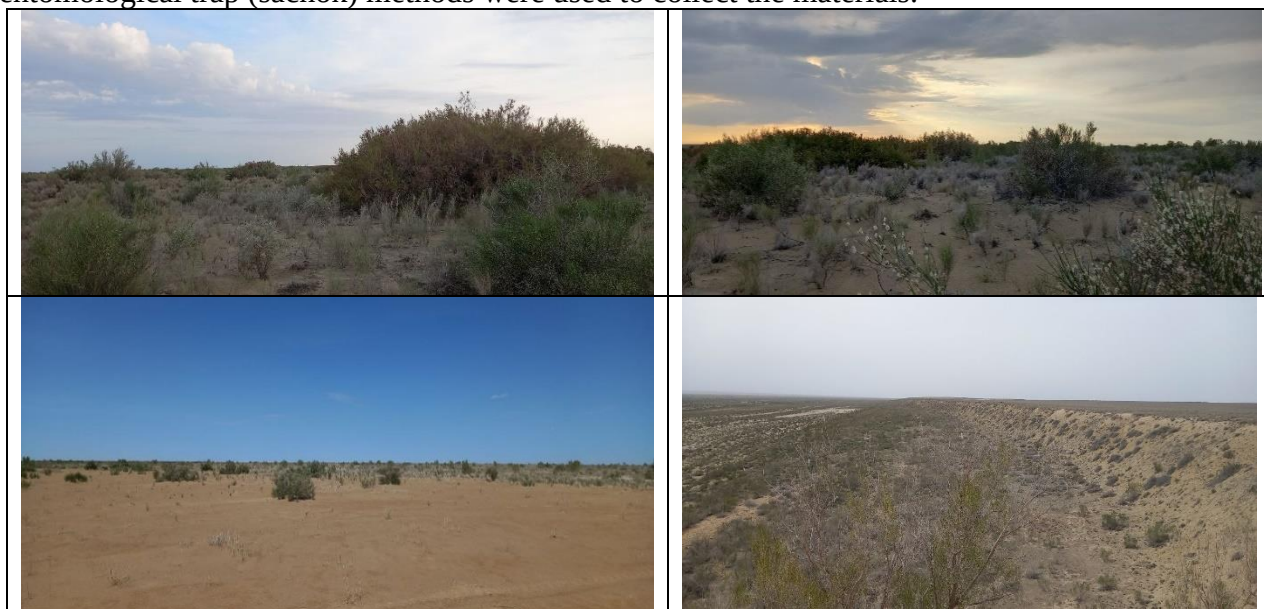


Figure 1. Research areas

The obtained results and their analysis

During the 2021-2024 research in Aralkum National Park Reserve, species belonging to the Aculeata infraorder were identified (Table 1).

Table 1

Aculeata infraorder species identified in Aralkum National Park Reserve

Apoidea				
№	Family	Sub-family	Genera	Species
1	Apidae	Apinae	<i>Apis</i>	<i>Apis mellifera</i>

2			<i>Amegilla</i>	<i>Amegilla quadrifasciata</i>
3			<i>Anthophora</i>	<i>Anthophora radoszkowskyi.</i>
4			<i>Eucera</i>	<i>Eucera clypeata</i>
5			<i>Ammophila</i>	<i>Ammophila heydeni</i>
6	<i>Ammophila sabulosa</i>			
7	<i>Podalonia</i>	<i>Podalonia affinis</i>		
8		<i>Podalonia tydei</i>		
9		<i>Podalonia hirsuta</i>		
10	Sphecidae	Sphecinae	<i>Prionyx</i>	<i>Prionyx viduatus</i>
11			<i>Prionyx niveatus</i>	
12	Crabronidae	Pemphredoninae	<i>Psenulus</i>	<i>Psenulus laevis</i>
13			<i>Pemphredon</i>	<i>Pemphredon lethifer</i>
14		Astatinae	<i>Astata</i>	<i>Astata boops</i>
15		Crabroninae	<i>Liris</i>	<i>Liris niger</i>
16			<i>Tachysphex</i>	<i>Tachysphex costae</i>
17				<i>Tachysphex erythropus</i>
18				<i>Tachysphex fulvitaris</i>
19				<i>Tachysphex panzeri</i>
20			<i>Trypoxylon</i>	<i>Trypoxylon scutatum</i>
21		Bembicinae	<i>Bembix</i>	<i>Bembix oculata</i>
22			<i>Stizus</i>	<i>Stizus ruficornis</i>
23		Philanthinae	<i>Philanthus</i>	<i>Philanthus triangulum</i>
24			<i>Cerceris</i>	<i>Cerceris bupresticida</i>
25				<i>Cerceris straminea</i>
Scolioidea				
26	Scolidae	Scoliinae	<i>Scolia</i>	<i>Scolia sexmaculata</i>
27				<i>Scolia</i> sp.
28				<i>Scolia</i> sp
Pompiloidea				
29	Pompilidae	Pepsinae	<i>Cryptocheilus</i>	<i>Cryptocheilus annulatus</i>
Vespoidea				
30	Vespidae	Eumeninae	<i>Eumenes</i>	<i>Eumenes sareptanus</i>
31			<i>Euodynerus (Pareuodynerus)</i>	<i>Euodynerus (Pareuodynerus) strigatus</i>
32				<i>Euodynerus rufinus</i>
33				<i>Euodynerus strigatus</i>
34			<i>Eustenancistrocerus</i>	<i>Eustenancistrocerus askhabadensis</i>
35			<i>Pseudepipona</i>	<i>Pseudepipona herrichii</i>
36			<i>Chlorodynerus</i>	<i>Chlorodynerus incisipes</i>
Formicoidea				
37	Formicidae	Formicinae	<i>Cataglyphis</i>	<i>Cataglyphis aenescens</i>
38				<i>Cataglyphis setipes</i>
39			<i>Camponotus</i>	<i>Camponotus turkestanicus</i>
40			<i>Formica</i>	<i>Formica clara</i>
41				<i>Formica subpilosa</i>
42		<i>Lepisiota</i>	<i>Lepisiota semenovi</i>	
43		Myrmicinae	<i>Monomorium</i>	<i>Monomorium Kusnezowi</i>
44			<i>Crematogaster</i>	<i>Crematogaster subdentata</i>

45			Messor	Messor aralocaspius
46				Messor subgracilinodis
47		Dolichoderinae	Tapinoma	Tapinoma karavaievi
48				Tapinoma sp.
Total	7	14	32	48

When we analyzed the obtained results, 48 species belonging to 7 families, 14 subfamilies, and 32 genera of the Aculeata infraorder were recorded in Aralkum National Park Reserve. When we determined the distribution of these identified species in vegetation cover, the most 36 species were recorded in Yulgunzar, 32 species in Saxaulzar, 24 species in Kandymzar, and 16 species were recorded in mixed vegetation or sandy low-elevations.

In conclusion, when we conducted research in Aralkum National Park Reserve in 2021-2024, 48 species belonging to 7 families, 14 subfamilies, and 32 genera of Aculeata infraorder were recorded. During the research, it was observed that the species *Ammophila heydeni*, *Cerceris straminea*, *Cataglyphis aenescens* are widespread in the studied area. In the Aralkum National Park, when we determined the distribution of Aculeata infraorder in the vegetation cover, the most 36 species were recorded in Yulgunzar, 32 species in Saxaulzar, and 24 species in Kandymzar, and the least 16 species were recorded in mixed vegetation or sandy low-elevations.

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Rezyume: Maqolada 2021-2024 yillarda Orolqum milliy bog'i qo'riqxonasida olib borilgan tadqiqotlarimiz, tadqiqotlarimiz haqida ma'lumotlar keltirilgan. Tadqiqotlarga ko'ra, Aculeata kenja oilasining 7 oilasi, 14 kenja oilasi va 32 avlodiga tegishli 48 tur turli darajalarda tarqalgan. Ular orasida *Ammophila heydeni*, *Cerceris straminea*, *Cataglyphis aenescens* turlari keng tarqalgan. Orolqum milliy bog'ida Aculeata turkumining eng ko'p turlari Yulgunzorda (36 tur), saksovulzorda (32 tur) va Qandimzorda (24 tur) hamda o'simliklari aralash past yoki past tog'li hududlarda tarqalgan. qum, 16 tur eng kam tarqalgan.

Резюме: В статье приведены данные наших исследований, проведенных в заповеднике «Аралкумский национальный парк» в 2021-2024 годах. По данным исследований, на разных уровнях распространены 48 видов, принадлежащих к 7 семействам, 14 подсемействам и 32 родам подсемейства Aculeata. Среди них распространены виды *Ammophila heydeni*, *Cerceris straminea*, *Cataglyphis aenescens*. В Аралкумском национальном парке большинство видов подсемейства Aculeata распространены в Юлгунзаре (36 видов), в Саксаулзаре (32 вида), в Кандымзаре (24 вида), а также в низкогорных районах со смешанной растительностью или песок, наименее распространены 16 видов.

Kalit so'zlar: Orolqum, Aculeata, Apidae infraorder, avlod, Yulgunzor, Saksovulzor, shakarqamish.

Ключевые слова: Аралкум, Aculeata, инфраотряд Apidae, генерация, Юлгунзар, Саксаулзар, сахарный тростник.

**FAUNA AND ECOLOGY OF VARIOUS AGRO-CENOZOIC PHYTONEMATODES
DISTRIBUTED IN THE REGIONS OF THE REPUBLIC OF KARAKALPAKISTAN**

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National University of Uzbekistan named after Mirzo Ulugbek

Summary: *This article will study the fauna and ecology of phytonematodes, which are harmful to various crops grown in agriculture in the Republic of Karakalpagestan, considered an important region of Uzbekistan. In particular, according to the State Statistics Committee, in 2023 alone, more than 317,400 tons of grain crops, more than 35,000 tons of legumes, 94,700 tons of tomatoes, 53,200 tons of cucumbers, 96,000 tons of potatoes, and more than 183,500 tons of melons for food products were grown in the Republic of Karakalpagistan. The Republic of Karakalpakstan is characterized by its unique climate and soil conditions, and various crops are grown, however, despite the fact that the region is increasingly threatened by phytonematodes in agriculture. These microscopic worms damage plant roots, cause a number of symptoms ranging from slow growth to wilting of the plant's body, and consequently significantly lose yield. Therefore, scientific research on the relationship of phytonematodes to plants is important, as they provides detailed information about the fauna and individual species of phytonematodes. The main purpose of the study is to study and analyze the fauna and ecology of various agro-cainozoic phytonematodes distributed on the territory of the Republic of Karakalpakstan. Analysis of the distribution characteristics of phytonematodes in the root of the plant and the soil around it is determined to determine the types and distribution patterns of nematodes.*

Key words: *phytonematodes, fauna; agrocenosis; agriculture; parasite; soil; individ; type.*

Introduction: In contemporary agriculture, various adverse changes in cultivated plants are arising due to multiple stress factors. Among these, nematodes (Nematoda) represent a class of parasitic organisms that cause significant damage to agricultural crops [25]. Nematodes comprise a diverse group of free-living and parasitic species adapted to various habitats. These nematodes possess adaptations that enable them to thrive in different environments and can be found in both plants and animals [40]. Phytoparasitic nematodes are widespread across various plant and crop species worldwide, leading to substantial economic losses. Currently, there are over 4,100 species of phytoparasitic nematodes globally, resulting in annual economic losses in agriculture estimated to be around \$125 billion. In recent years, the demand for agricultural and natural products has been increasing globally, highlighting the significant impact of nematodes [30]. Most nematode species are associated with plants, making scientific research on the relationships between phytoparasitic nematodes and plants crucial. In addition to pressing global food security issues, concerns about pest and disease control are intensifying. This is related to the forecasted risks of climate change and the emergence of new pests, including nematodes. Such research provides comprehensive information about the fauna and specific species of phytoparasitic nematodes. Our study aims to investigate and analyze the fauna and ecology of various agrocenosis phytoparasitic nematodes in the territory of the Republic of Karakalpakstan. According to several studies, the quantitative and qualitative composition of phytoparasitic nematodes is not constant and varies over time and across different environments. These changes can be attributed to various factors such as crop cultivation practices, plant nematode specificity, plant growth and development, and environmental changes.

LITERATURE REVIEW.

Structure, Classification, and Types of Nematodes: Nematodes are a type of animal typically characterized by their microscopic size, cylindrical body shape, and lack of an external skeleton. These organisms can be found living freely in terrestrial and aquatic environments, as well as parasitizing the organs of plants and animals. There are over 25,000 described species of nematodes [17, 44]. Some literature sources indicate that there are more than 25,000 species, with approximately 10,000 free-living marine and terrestrial nematodes, 3,500 invertebrate parasites, and

12,000 vertebrate parasitic nematodes [21, 31]. Nematodes are among the most diverse and abundant groups of invertebrates on Earth, notable for their sensitivity to pollutants and ecological disturbances [16, 19, 28]. They are highly adaptable to nearly all types of ecosystems and are considered one of the most species-rich groups of microorganisms [10]. Nematodes are some of the most important and numerous animals in the animal kingdom, capable of surviving in almost any environment [1, 29]. Commonly referred to as "roundworms," these organisms have a fundamentally simple structure yet are ubiquitous, appearing in nearly all types of multicellular living organisms. When considering all animal species on Earth, nematodes may have more diverse types than any other animal group [6, 34, 36]. The body structure of nematodes closely resembles that of worms (see Figure 1).

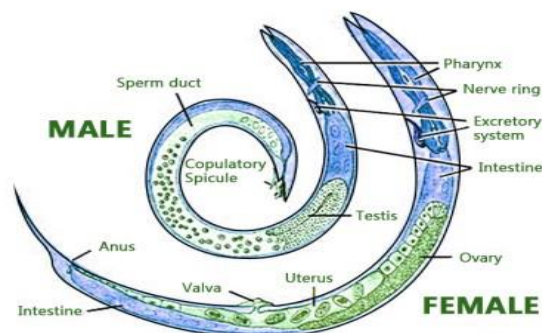


Figure 1. Nematode structure (www.geeksforgeeks.org).

The development of nematodes comprises five stages, including four larval stages (L1, L2, L3, L4) and one adult stage (L5) [9]. The nematode's body is a slender cylinder, tapering at both ends. The muscles of nematodes are divided into four groups, with dorsal and ventral muscle groups on the right and left sides extending longitudinally along its body. These dorsal and ventral muscle groups are innervated separately and contract alternately to produce dorso-ventral flexion. This up and down movement, where the animal bends first to one side and then to the other, is characteristic of nematodes. Nematodes cannot twist or rotate because they only have longitudinal muscles, and thus cannot move by alternating the contraction and expansion of different body parts. They can only move dorsally or ventrally [4, 24, 25, 39, 44]. Nematodes have four nerves running along the length of their bodies: the dorsal nerve, the ventral nerve, and two lateral nerves located at the midpoints of each side. If a nematode worm is cut longitudinally and viewed under a microscope, it can be observed that the nerves are positioned in quadrants. The lateral nerves are mainly sensory, while the dorsal and ventral nerves transmit impulses that cause muscle contractions. Therefore, lateral nerves transmit impulses to the brain, whereas the dorsal and ventral nerves transmit impulses from the brain to the muscles. The brain, called the cerebral ganglion, is located ventrally in the anterior nerve ring and controls the nematode's neural tissue [8, 13, 40, 45]. The digestive system of nematodes is simple, consisting of a straightforward intestine. The nematode's mouth often has jaws, and in parasitic forms, they can actively bite through tissue. Free-living forms use their jaws to capture prey or to grasp ingested debris. The remainder of the intestine is a simple tube, only one cell layer thick, with folds or loops that connect it to the body wall [4, 12, 15, 32, 44].

Plant-Parasitic Nematodes in Soil: In a global context where the demand for natural agricultural products is steadily increasing, particularly in rapidly growing populations like Uzbekistan, the cultivation of high-quality and nutritious agricultural products is a pressing issue. Combating plant diseases and pests is a primary challenge in agriculture, as achieving high yields and sustainable cultivation requires the prudent use and management of ecosystems [35]. Among various adverse stress factors in agricultural production, nematodes are particularly significant. Despite their microscopic size, nematodes cause the loss of billions of dollars worth of crops

annually, and virtually all crops worldwide are affected by at least one type of nematode parasite [5]. Nematodes are the most important and widespread soil invertebrates, occupying a crucial position in all trophic levels of the soil ecosystem [11, 45]. Plant-parasitic nematodes are a major stress factor in crop production [43]. These nematodes are referred to as plant parasites because they directly assimilate nutrients from plants. Phytonematodes possess a needle-like structure called a stylet, which aids in piercing plant cell walls and extracting nutrient-rich sap [3]. Accurate identification of nematode species is essential for selecting appropriate control methods. The economic impact of yield losses due to nematodes is varied, often associated with decreased crop quality and productivity. Taxonomy based on nematode morphology is complex due to species variability, but tools and techniques based on biochemical and molecular markers can successfully diagnose a wide range of nematode species [7, 27]. Nematodes can damage nearly all parts of plants, including roots, stems, leaves, fruits, and seeds, either individually or in conjunction with other soil microorganisms [41]. Although the recognition of nematodes as a significant cause of plant diseases on a global scale has only been acknowledged since the mid-20th century, nematodes have been studied for over 150 years. The most harmful plant-parasitic nematodes are root-knot nematodes (RKNs), and *Meloidogyne* sp [2]. Worldwide, chemical pesticides are used to combat these parasites in vegetable crops [38]. However, this approach also eliminates beneficial soil organisms, highlighting the need for alternative methods to neutralize parasitic nematodes. Sustainable production systems should employ eco-friendly alternatives to maintain and enhance the health of antagonistic organisms. Soils with high antagonistic potential do not foster pathogens [14, 18, 42].

METHODS.

Research area natural climate: The natural conditions of the Republic of Karakalpakstan are somewhat unfavorable, which is directly related to its geographical location. The region is situated between 40°C and 45°C latitudes, which ensures a specific moderation of the climate, a key factor of natural conditions. However, due to its considerable distance from oceans and seas, and its location between the Karakum and Kyzylkum deserts, the region exhibits distinctly continental climatic features. These features are characterized by scorching and dry summers, and harsh and dry winters (Figure 2).

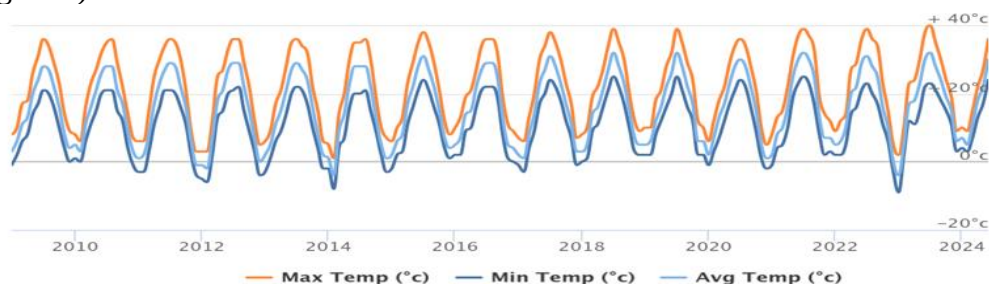


Figure 2. The average annual amount of climate change in the Republic of Karakalpakstan (<https://map.worldweatheronline.com/>).

In the Republic of Karakalpakstan, average temperature changes between 2010 and 2023 are illustrated in figure 4. Temperature ranges from -12 to 42 °C are possible. The sharp rise in temperature is attributed to the decrease in soil moisture and unique hydrothermal regimes. Significant variations were observed during the rainy season. The highest temperature peak was recorded in 2019.

Annual average precipitation in Karakalpakstan between 2010 and 2023 showed significant variability, ranging from 100 mm to 220 mm. Rainfall amounts varied from season to season, with some years experiencing sufficient rainfall from strong storms, while others recorded abundant precipitation. In 2019, the highest rainfall was recorded, positively impacting soil fertility and agricultural productivity. Competent storms lower air temperatures, increase soil moisture content, and in some years freeze and replant crop fields.

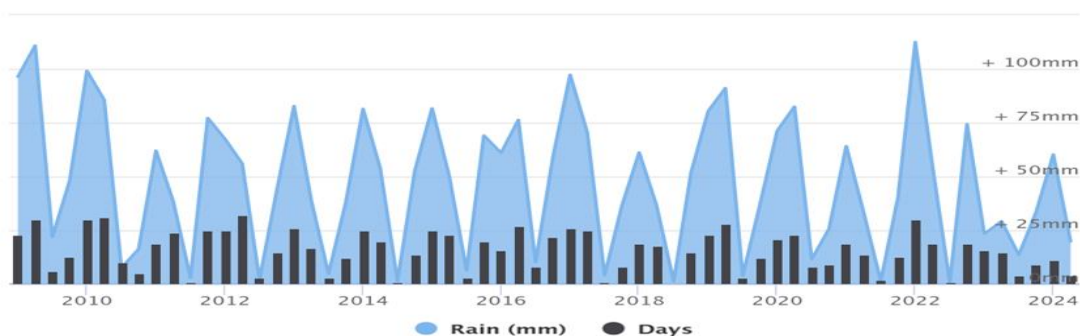


Figure 3. Average annual precipitation of the Republic of Karakalpakstan (<https://map.worldweatheronline.com/>).

Decrease in precipitation and higher temperatures during summer months lead to increased evaporation from the soil. Evaporation amounts to 1280-1470 mm, with atmospheric precipitations contributing 320-363 mm, resulting in a moisture deficit of 960-1107 mm. The wind direction varies, with significant differences observed in January and July. The prevailing wind direction predominantly affects the northern, central, and eastern regions towards the southwest, while in the southern-western regions, the wind predominantly blows from the north. The prevailing wind blows from the northern direction, partly shifting towards the northeast.

Object of Study: Scientific research was conducted in the districts of Turtkul, Beruni, Amudarya, Khojayli, and Chimbay in the Karakalpakstan Republic. Samples were collected from these areas (Figure 4).

1- point Turtkul

41°53'25.7"N 61°22'52.0"E

2- point Beruni

41°54'57.9"N 60°49'42.6"E

3- point Amudarya

42°10'08.3"N 60°13'06.3"E

4- point Khojayli

42°23'21.6"N 59°17'24.7"E

5- point Chimbay

42°56'22.4"N 59°38'23.3"E



Figure 4. The coordinates of the point from which the soil samples are obtained are, 2024-y.

Soil samples are believed to have been taken from sites previously planted with family crops Cucurbitaceae. Soil and root samples were taken from the upper 30 cm soil layer.

Sample Collection va Laboratory Analysis: Samples were systematically collected from various locations within the specified districts to ensure a comprehensive representation of the area's environmental conditions. The sampling sites were chosen based on their ecological significance and potential impact on the study's objectives. Nematodes were extracted using the modified Baermann method and the route methods as specified by Whitehead and Hemming [20, 26, 33, 37, 46]. The species composition of nematodes was determined according to the generally accepted method. The identification of nematode species composition was carried out using a BX53 microscope with a light source, "OLYMPUS", SC-180 (Japan, 2018). In calculating the dominance

level of phytonematodes present in plant roots and rhizosphere soils, the individual percentages of all identified species were calculated (Figure 5).



Figure 5. Detection of nematodes in soil sample in the laboratory, 2024-y.

According to the classification, species that make up more than 10.0% of the total number of individuals in the detected species are called eudominants, 5.1-10.0% are dominants, 2.1-5.0% are subdominants, 1.1-2.0% are residents, and less than 1.0% are subrecedents [22, 23]. To identify nematodes isolated from samples, temporary and permanent microscopic preparations were prepared according to the methods of E.S. Kiryanova and E.L. Krall [47].

By adhering to these methodological frameworks, the study aims to provide a robust and detailed understanding of the environmental conditions in the Karakalpakstan Republic.

RESULTS AND DISCUSSION.

Ecological groups of identified phytonematodes: As a result of the studies, research was carried out in four regions of the Republic of Karakalpakstan, Beruniy, Amudaryo, Khojayli, Chimbay districts into 6 large ecological groups according to the relationship of phytonematodes with plants and the method of nutrition identified in the soil of certain Palak crops and their root environment (Figure 6).

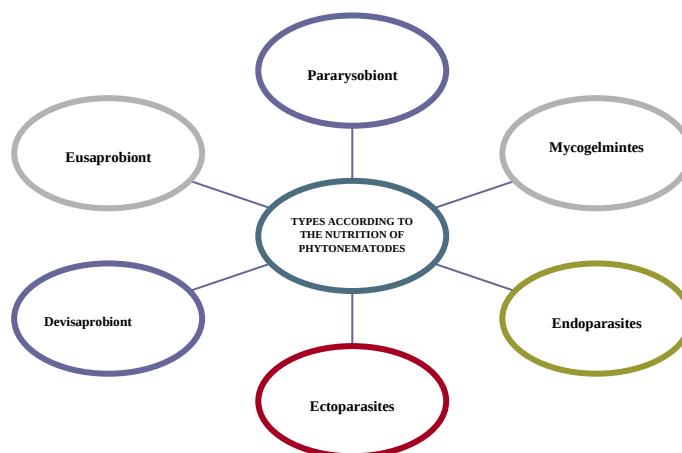


Figure 6. Ecological groups of phytonematodes according to their feeding method

According to the above method of nutrition, 6 large ecological groups are not uniformly distributed in the research areas. The faunistic complex of Cucurbitaceae family plants and their root environment nematodes in soils was dominated by devisaprobionts feeding on plant residues. Studies of the phytonematodes of boring and melon plants from Cucurbitaceae family crops and the soils of their root environment have identified 2 classes (*Adenophorea*, *Secernentea*) of the younger Class, 4 categories (*Dorylaimida*, *Rhabditida*, *Aphelenchida*, *Tylenchida*) of the order, 12 families, 22 generations from 39 species. Of the phytonematode species identified, *Rhabditida* species are in the leading position (19 generations), accounting for 48.7% of the total identified species. Next are *Aphelenchida* (11; 28.2%) and *Tylenchida* (8; 20.5%). Representatives of the *Dorylaimida* (1; 2.5%) category were found in the lowest number.

During the studies, the species composition and distribution of phytonematodes identified in Cucurbitaceae family crops and their ecological relationship with plants were analyzed in a biotope cross-section. The 39 species that make up the nematode fauna of Cucurbitaceae family crops are mainly A in the classification and description of ecological groups according to their nutritional and vital characteristics. A. Paramonov, G.W. The work of Yeates and others was used [48,49,50,51]. A.A. Based on the system proposed by Paramonov, plant nematodes are classified into *pararisobionts*, *eusaprobionts*, *devisaprobionts*, *mycogelmints*, and *parasitic* phytoelmints. These ecological groups are also in turn separated into several more subgroups [48]. *Pararisobionts* usually live freely in the soil around the root. Most species feed on plant cell sap but do not cause serious damage to the plant. In our material, *pararisobionts* contain 1 species in a small number of groups.

Conclusion: In the districts of the Republic of Karakalpakstan Turtkul, Beruni, Amudarya, Khojayli, and Chimbay, a group of *devisaprobionts* of nematodes prevails on the soils of Cucurbitaceae family crops and their root circumference. A study on phytonematodes of *Cucumis sativus* L and *Cucumis melo* plants and their root circumference soils revealed 2 younger classes, 4 category, 12 families, 22 generation, and 39 species. Among these, *Rhabditida*'s representatives took the leading position, accounting for 48.7% of the total. Next were *Aphelenchida* and *Tylenchida*, respectively 28.2% and 20.5%. Representatives of the Dorylaimida series, on the other hand, suffered in the fewest numbers. These results provide important information about the ecological environment and phytonematode distribution. Comparison of the composition and population density of nematode species in the areas under study of Cucurbitaceae family crops and their root circumference soils showed a significant difference in the composition of the nematode fauna and its structure under different conditions. Apparently, this difference is explained by the condition of the soil, the peculiarity of the plant, and the dependence on agrotechnical measures applied to crops.

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Rezyume: *Ushbu maqolada O'zbekistonning muhim hududlaridan hisoblangan Qoraqolpog'iston Respublikasida qishloq xo'jaligida yetishtiriladigan turli ekinlarga zarar keltiradigan fitonematodalarining faunasi va ekologiyasi o'rganilgan. Xususan davlat statistika qo'mitasining ma'lumotlariga ko'ra, birgina 2023 yilda Qoraqolpog'iston Respublikasida 317 ming 400 tonnadan ortiq donli ekinlar, 35 ming tonnadan ortiq dukkakli don ekinlari, 94 ming 700 tonna pomidor, 53 ming 200 tonna bodring, 96 ming tonna kartoshka va 183 ming 500 tonnadan ortiq oziqbop poliz ekinlari yetishtirilgan. Qoraqolpog'iston Respublikasi o'ziga xos iqlimi va tuproq sharoiti bilan ajralib turadi, turli ekinlar yetishtiriladi. Biroq, shunday bo'lishiga qaramay mintaqa qishloq xo'jaligi fitonematodalar tomonidan tobora ko'proq xavf ostida qolmoqda. Ushbu mikroskopik qurtlar o'simlik ildizlarini zararlab, o'sishning susayishidan tortib, o'simlik tanasining so'lib qolishgacha bo'lgan bir qator alomatlarini keltirib chiqaradi va natijada hosilning sezilarli*

darajada yo'qolishiga olib keladi. Shuning uchun fitonematodalarining o'simliklar bilan aloqasi haqidagi ilmiy tadqiqotlar muhim ahamiyatga ega, chunki ular fitonematodalarining faunasi va alohida turlari haqida batafsil ma'lumot beradi. Tadqiqotning asosiy maqsadi Qoraqalpog'iston Respublikasi hududida tarqalgan turli agrotsenoz fitonematodlarining faunasi va ekologiyasini o'rganish va tahlil qilishdan iborat. O'simlik ildizi va atrofida tuproqda fitonematodalarining tarqalish xususiyatlarini tahlil qilish nematodalarining turlari va tarqalish qonuniyatlarini ochib berilishi aniqlanadi.

Резюме: В этой статье будет изучена фауна и экология фитонематод, которые наносят вред различным культурам, выращиваемым в сельском хозяйстве Республики Каракалпакстан, считающейся важным регионом Узбекистана. В частности, по данным Госкомстата, только в 2023 году в Республике Каракалпакстан было выращено более 317 400 тонн зерновых культур, более 35 000 тонн бобовых, 94 700 тонн томатов, 53 200 тонн огурцов, 96 000 тонн картофеля и более 183 500 тонн бахчевых культур для производства продуктов питания. Республика Каракалпакстан характеризуется своими уникальными климатическими и почвенными условиями, здесь выращиваются различные сельскохозяйственные культуры, однако, несмотря на то, что региону все чаще угрожают фитонематоды в сельском хозяйстве. Эти микроскопические черви повреждают корни растений, вызывают ряд симптомов, начиная от замедления роста и заканчивая увяданием растения и, как следствие, значительной потерей урожая. Поэтому научные исследования взаимосвязи фитонематод с растениями важны, поскольку они дают подробную информацию о фауне и отдельных видах фитонематод. Основной целью исследования является изучение и анализ фауны и экологии различных агрокайнозойских фитонематод, распространенных на территории Республики Каракалпакстан. Для определения типов и закономерностей распространения нематод проводится анализ характеристик распределения фитонематод в корне растения и почве вокруг него.

Kalit so'zlar: fitonematoda, fauna; agrotsenoz; qishloq xo'jaligi; parazit; tuproq; individ; tur.

Ключевые слова: фитонематоды, фауна; агроценоз; сельское хозяйство; паразит; почва; индивид; тип.

UDC 517.912

SOLVING FRACTIONAL ORDER DIFFERENTIAL EQUATIONS USING INTEGRAL TRANSFORMATIONS

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Summary: The paper examines the solution of fractional order differential equations using integral transformation methods. The analytical solution of an inhomogeneous differential equation of fractional order is found using the integral transformations of Laplace, Elzaki, Mohand, Sumudu and Sawi.

Key words: integral transformations, inhomogeneous fractional differential equations, solution.

Interest in fractional equations, both ordinary and partial derivatives, has been steadily growing in recent decades. This is due to the need to model processes in which the current state significantly depends on previous states of the process, i.e., so-called systems with “residual” memory. Integral transformations are one of the analytical approaches that are used in solving fractional differential equations. Integral transformations are important for facilitating the solution of differential equations that are difficult to solve at certain limiting or initial values. Among the integral transforms, the most commonly used is the Laplace transform (LT), which transforms a time variable into a frequency variable, making it easier to solve fractional differential equations that seem difficult to solve. Most of the proposed and applied transformations are actually extensions of LT. Over the past two decades, several integral transformations have been introduced to facilitate the solution of fractional differential equations such as LT. For example, one such transformation, the Sumudu integral transform (ST), was proposed by Watugal as an alternative to the Laplace transform in the 1990 s [1]. The special properties of the Sumudu transformation include preserving the dimension of the function; the units of measurement of the function itself and its image are the same. Its disadvantages include the fact that there is no explicit formula for calculating the inverse transformation. The inversion can be accomplished through solving the corresponding Fredholm integral equation of the first kind, which reduces to solving an ill-conditioned system of linear algebraic equations. The Elzaki integral transform is derived from the classical Fourier integral by Tarig Elzaki to facilitate the process of solving ordinary and partial differential equations in the time domain. Transformations such as Laplace, Sumudu, Elzaki, Aboodh, Kamal, Poureza and Mohanda were introduced in [2-7]. Let us apply these integral transformations to solve an inhomogeneous differential equation of fractional order.

Given a function $f(x)$ defined for $0 < x < \infty$, the Laplace transform $F(s)$ is defined as:

$$F(s) = L[f(x)] = \int_0^{\infty} f(x)e^{-sx} dx, \quad (1)$$

at least for those s for which the integral converges.

Let's $f(x)$ be a continuous function on the interval $[0, \infty)$ which is of exponential order, that is, for some $c \in R$ and $x > 0$

$$\sup \frac{|f(x)|}{e^{cx}} < \infty.$$

In this case the Laplace transform (1) exists for all $s > c$ [8].

Some of the useful Laplace transforms which are applied in this paper, are as follows:

$$L[f(x) + g(x)] = F(s) + G(s),$$

$$L[x^\beta] = \frac{\Gamma(\beta+1)}{s^{\beta+1}}, \quad \beta > -1,$$

$$L[f^{(n)}(x)] = s^n F(s) - s^{n-1} f(0) - s^{n-2} f'(0) - \dots - f^{(n-1)}(0),$$

$$L^{-1}[s^{-\beta}] = \frac{x^{\beta-1}}{\Gamma(\beta)}.$$

$$L[x^n f(x)] = (-1)^n F^{(n)}(s),$$

Lemma. The Laplace transform of Riemann-Liouville fractional integral operator of order $\alpha > 0$ can be obtained in the form of:

$$L[D^\alpha f(x)] = \frac{F(s)}{s^\alpha}.$$

Consider the equation,

$$\begin{aligned} D^{\alpha+1}[x(t)] + D^\alpha[x(t)] + x'(t) + x(t) = \\ = \frac{(n-1)!}{\Gamma(n-2-\alpha)} t^{n-3-\alpha} - \frac{\Gamma(n)}{\Gamma(n-\alpha)} t^{n-1-\alpha} + (n^2 - 3n + 2)t^{n-3} - t^{n-1}, \end{aligned} \quad (2)$$

$$x(0) = x'(0) = 0, \quad 0 < \alpha \leq 1, \quad (n \geq 4, n \in \mathbb{N}).$$

solve equation (2) using the Laplace transform,

$$\begin{aligned} L[D^{\alpha+1}[x(t)] + D^\alpha[x(t)] + x'(t) + x(t)] = \\ = L\left[\frac{(n-1)!}{\Gamma(n-2-\alpha)} t^{n-3-\alpha} - \frac{\Gamma(n)}{\Gamma(n-\alpha)} t^{n-1-\alpha} + (n^2 - 3n + 2)t^{n-3} - t^{n-1}\right], \\ L[D^{\alpha+1}[x(t)]] + L[D^\alpha[x(t)]] + L[x'(t)] + L[x(t)] = \\ = \frac{(n-1)!}{\Gamma(n-2-\alpha)} L[t^{n-3-\alpha}] - \frac{\Gamma(n)}{\Gamma(n-\alpha)} L[t^{n-1-\alpha}] + (n^2 - 3n + 2)L[t^{n-3}] - L[t^{n-1}], \\ s^{\alpha+1}F(s) + s^\alpha F(s) + sF(s) + F(s) = \\ = \frac{(n-1)!}{\Gamma(n-2-\alpha)} \frac{\Gamma(n-2-\alpha)}{s^{n-2-\alpha}} - \frac{\Gamma(n)}{\Gamma(n-\alpha)} \frac{\Gamma(n-\alpha)}{s^{n-\alpha}} + \frac{(n^2 - 3n + 2)\Gamma(n-2)}{s^{n-2}} - \frac{\Gamma(n)}{s^n}, \end{aligned}$$

$$F(s)(s^{\alpha+1} + s^\alpha + s + 1) = \frac{(n-1)!}{s^{n-2-\alpha}} - \frac{\Gamma(n)}{s^{n-\alpha}} + \frac{(n-1)(n-2)\Gamma(n-2)}{s^{n-2}} - \frac{\Gamma(n)}{s^n},$$

$$F(s)(s^\alpha + 1)(s + 1) = \frac{(n-1)!}{s^n} (s^{\alpha+2} - s^\alpha + s^2 - 1),$$

$$F(s)(s^\alpha + 1)(s + 1) = \frac{(n-1)!}{s^n} (s^\alpha + 1)(s^2 - 1),$$

$$F(s) = \frac{(n-1)!}{s^n} (s - 1),$$

$$F(s) = \frac{(n-1)!}{s^{n-1}} - \frac{(n-1)!}{s^n},$$

$$L^{-1}[F(s)] = L^{-1}\left[\frac{(n-1)!}{s^{n-1}}\right] - L^{-1}\left[\frac{(n-1)!}{s^n}\right],$$

$$x(t) = (n-1)t^{n-2} - t^{n-1}.$$

Sumudu transformation [4]

$$f(x) \Rightarrow F(u)$$

$$F(u) = S[f(x)] = \int_0^{\infty} f(ux)e^{-x} dx. \quad (3)$$

$$S[x^{\beta}] = u^{\beta} \Gamma(\beta + 1),$$

$$S[f^{(n)}(x)] = \frac{F(u)}{u^n} - \frac{f(0)}{u^n} - \frac{f'(0)}{u^{n-1}} - \dots - \frac{f^{(n-1)}(0)}{u},$$

$$S^{-1}[u^{\beta-1}] = \frac{x^{\beta-1}}{\Gamma(\beta)}.$$

Let's solve equation (2) using (3):

$$\begin{aligned} S[D^{\alpha+1}[x(t)] + D^{\alpha}[x(t)] + x'(t) + x(t)] &= \\ &= S\left[\frac{(n-1)!}{\Gamma(n-2-\alpha)}t^{n-3-\alpha} - \frac{\Gamma(n)}{\Gamma(n-\alpha)}t^{n-1-\alpha} + (n^2 - 3n + 2)t^{n-3} - t^{n-1}\right], \\ S[D^{\alpha+1}[x(t)]] + S[D^{\alpha}[x(t)]] + S[x'(t)] + S[x(t)] &= \\ &= \frac{(n-1)!}{\Gamma(n-2-\alpha)}S[t^{n-3-\alpha}] - \frac{\Gamma(n)}{\Gamma(n-\alpha)}S[t^{n-1-\alpha}] + (n^2 - 3n + 2)S[t^{n-3}] - S[t^{n-1}], \\ u^{-\alpha-1}F(u) + u^{-\alpha}F(u) + u^{-1}F(u) + F(u) &= \\ &= \frac{(n-1)!}{\Gamma(n-2-\alpha)}\Gamma(n-2-\alpha)u^{n-2-\alpha} - \frac{\Gamma(n)}{\Gamma(n-\alpha)}\Gamma(n-\alpha)u^{n-\alpha} + (n^2 - 3n + 2)\Gamma(n-2)u^{n-2} - \Gamma(n)u^n, \end{aligned}$$

$$F(u)(u^{-\alpha-1} + u^{-\alpha} + u^{-1} + 1) = (n-1)!u^{n-2-\alpha} - \Gamma(n)u^{n-\alpha} + (n-1)(n-2)\Gamma(n-2)u^{n-2} - \Gamma(n)u^n,$$

$$F(u)(u^{-\alpha} + 1)(u^{-1} + 1) = (n-1)!u^n(u^{-\alpha-2} - u^{-\alpha} + u^{-2} - 1),$$

$$F(u)(u^{-\alpha} + 1)(u^{-1} + 1) = (n-1)!u^n(u^{-\alpha} + 1)(u^{-2} - 1),$$

$$F(u) = (n-1)!u^n(u^{-1} - 1),$$

$$F(u) = (n-1)!u^{n-1} - (n-1)!u^n,$$

$$S^{-1}[F(u)] = S^{-1}[(n-1)!u^{n-1}] - S^{-1}[(n-1)!u^n],$$

$$x(t) = (n-1)t^{n-2} - t^{n-1}.$$

Elzaki transformation [3]

$$f(x) \Rightarrow T(u)$$

$$T(u) = E[f(x)] = u^2 \int_0^{\infty} f(ux)e^{-x} dx. \quad (4)$$

$$E[x^{\beta}] = u^{\beta+2} \Gamma(\beta + 1),$$

$$E[f^{(n)}(x)] = \frac{T(u)}{u^n} - \sum_{k=0}^{n-1} u^{2-n+k} f^{(k)}(0),$$

$$E^{-1}[u^{\beta+2}] = \frac{x^{\beta+2}}{\Gamma(\beta + 1)}.$$

Let's find the solution to equation (2) using (4):

$$\begin{aligned} E[D^{\alpha+1}[x(t)] + D^{\alpha}[x(t)] + x'(t) + x(t)] &= \\ &= E\left[\frac{(n-1)!}{\Gamma(n-2-\alpha)}t^{n-3-\alpha} - \frac{\Gamma(n)}{\Gamma(n-\alpha)}t^{n-1-\alpha} + (n^2 - 3n + 2)t^{n-3} - t^{n-1}\right], \end{aligned}$$

$$E \left[D^{\alpha+1} [x(t)] \right] + E \left[D^{\alpha} [x(t)] \right] + E \left[x'(t) \right] + E [x(t)] = \\ = \frac{(n-1)!}{\Gamma(n-2-\alpha)} E \left[t^{n-3-\alpha} \right] - \frac{\Gamma(n)}{\Gamma(n-\alpha)} E \left[t^{n-1-\alpha} \right] + (n^2 - 3n + 2) E \left[t^{n-3} \right] - E \left[t^{n-1} \right],$$

$$u^{-\alpha-1}T(u) + u^{-\alpha}T(u) + u^{-1}T(u) + T(u) = \\ = \frac{(n-1)!}{\Gamma(n-2-\alpha)} \Gamma(n-2-\alpha) u^{n-1-\alpha} - \frac{\Gamma(n)}{\Gamma(n-\alpha)} \Gamma(n-\alpha) u^{n+1-\alpha} + (n^2 - 3n + 2) \Gamma(n-2) u^{n-1} - \Gamma(n) u^{n+1},$$

$$T(u) \left(u^{-\alpha-1} + u^{-\alpha} + u^{-1} + 1 \right) = (n-1)! u^{n-1-\alpha} - \Gamma(n) u^{n+1-\alpha} + (n-1)(n-2) \Gamma(n-2) u^{n-1} - \Gamma(n) u^{n+1},$$

$$T(u) \left(u^{-\alpha} + 1 \right) \left(u^{-1} + 1 \right) = (n-1)! u^{n+1} \left(u^{-\alpha-2} - u^{-\alpha} + u^{-2} - 1 \right),$$

$$T(u) \left(u^{-\alpha} + 1 \right) \left(u^{-1} + 1 \right) = (n-1)! u^{n+1} \left(u^{-\alpha} + 1 \right) \left(u^{-2} - 1 \right),$$

$$T(u) = (n-1)! u^{n+1} \left(u^{-1} - 1 \right),$$

$$T(u) = (n-1)! u^n - (n-1)! u^{n+1},$$

$$E^{-1} [T(u)] = E^{-1} \left[(n-1)! u^n \right] - E^{-1} \left[(n-1)! u^{n+1} \right],$$

$$x(t) = (n-1) t^{n-2} - t^{n-1}.$$

Mohand transformation

$$f(x) \Rightarrow M(s)$$

$$M(s) = M[f(x)] = s^2 \int_0^{\infty} f(x) e^{-sx} dx. \quad (5)$$

$$M[x^{\beta}] = \frac{\Gamma(\beta+1)}{s^{\beta+1}},$$

$$M[f^{(n)}(x)] = s^n M(s) - \sum_{j=0}^{n-1} \frac{f^{(j)}(0)}{s^{j-n+1}},$$

$$M^{-1}[s^{-\beta}] = \frac{x^{\beta+1}}{\Gamma(\beta+2)}.$$

Let us find the solution to equation (2) using transformation (5):

$$M \left[D^{\alpha+1} [x(t)] + D^{\alpha} [x(t)] + x'(t) + x(t) \right] = \\ = M \left[\frac{(n-1)!}{\Gamma(n-2-\alpha)} t^{n-3-\alpha} - \frac{\Gamma(n)}{\Gamma(n-\alpha)} t^{n-1-\alpha} + (n^2 - 3n + 2) t^{n-3} - t^{n-1} \right], \\ M \left[D^{\alpha+1} [x(t)] \right] + M \left[D^{\alpha} [x(t)] \right] + M \left[x'(t) \right] + M \left[x(t) \right] = \\ = \frac{(n-1)!}{\Gamma(n-2-\alpha)} M \left[t^{n-3-\alpha} \right] - \frac{\Gamma(n)}{\Gamma(n-\alpha)} M \left[t^{n-1-\alpha} \right] + (n^2 - 3n + 2) M \left[t^{n-3} \right] - M \left[t^{n-1} \right],$$

$$s^{\alpha+1} M(s) + s^{\alpha} M(s) + s M(s) + M(s) = \\ = \frac{(n-1)!}{\Gamma(n-2-\alpha)} \frac{\Gamma(n-2-\alpha)}{s^{n-4-\alpha}} - \frac{\Gamma(n)}{\Gamma(n-\alpha)} \frac{\Gamma(n-\alpha)}{s^{n-2-\alpha}} + \frac{(n^2 - 3n + 2) \Gamma(n-2)}{s^{n-4}} - \frac{\Gamma(n)}{s^{n-2}},$$

$$M(s) (s^{\alpha+1} + s^{\alpha} + s + 1) = \frac{(n-1)!}{s^{n-4-\alpha}} - \frac{\Gamma(n)}{s^{n-2-\alpha}} + \frac{(n-1)(n-2) \Gamma(n-2)}{s^{n-4}} - \frac{\Gamma(n)}{s^{n-2}},$$

$$M(s) (s^{\alpha} + 1) (s + 1) = \frac{(n-1)!}{s^{n-2}} (s^{\alpha+2} - s^{\alpha} + s^2 - 1),$$

$$M(s)(s^\alpha + 1)(s + 1) = \frac{(n-1)!}{s^{n-2}}(s^\alpha + 1)(s^2 - 1),$$

$$M(s) = \frac{(n-1)!}{s^{n-2}}(s - 1),$$

$$M(s) = \frac{(n-1)!}{s^{n-3}} - \frac{(n-1)!}{s^{n-2}},$$

$$M^{-1}[M(s)] = M^{-1}\left[\frac{(n-1)!}{s^{n-3}}\right] - M^{-1}\left[\frac{(n-1)!}{s^{n-2}}\right]$$

$$x(t) = (n-1)t^{n-2} - t^{n-1}.$$

Sawi transformation

$$f(x) \Rightarrow T(\mu)$$

$$T(\mu) = S[f(x)] = \frac{1}{\mu^2} \int_0^\infty f(x) e^{-\frac{x}{\mu}} dx. \quad (6)$$

$$S[x^\beta] = \mu^{\beta-1} \Gamma(\beta + 1),$$

$$S[f^{(n)}(x)] = \frac{T(\mu)}{\mu^n} - \sum_{k=0}^{n-1} \frac{f^{(k)}(0)}{\mu^{n-k+1}},$$

$$S^{-1}[\mu^\beta] = \frac{x^{\beta+1}}{\Gamma(\beta + 2)}.$$

Let us write the solution to equation (2) using (6):

$$S[D^{\alpha+1}[x(t)] + D^\alpha[x(t)] + x'(t) + x(t)] =$$

$$= S\left[\frac{(n-1)!}{\Gamma(n-2-\alpha)} t^{n-3-\alpha} - \frac{\Gamma(n)}{\Gamma(n-\alpha)} t^{n-1-\alpha} + (n^2 - 3n + 2)t^{n-3} - t^{n-1}\right],$$

$$S[D^{\alpha+1}[x(t)]] + S[D^\alpha[x(t)]] + S[x'(t)] + S[x(t)] =$$

$$= \frac{(n-1)!}{\Gamma(n-2-\alpha)} S[t^{n-3-\alpha}] - \frac{\Gamma(n)}{\Gamma(n-\alpha)} S[t^{n-1-\alpha}] + (n^2 - 3n + 2) S[t^{n-3}] - S[t^{n-1}],$$

$$\mu^{-\alpha-1}T(\mu) + \mu^{-\alpha}T(\mu) + \mu^{-1}T(\mu) + T(\mu) =$$

$$= \frac{(n-1)!}{\Gamma(n-2-\alpha)} \Gamma(n-2-\alpha) \mu^{n-4-\alpha} - \frac{\Gamma(n)}{\Gamma(n-\alpha)} \Gamma(n-\alpha) \mu^{n-2-\alpha} + (n^2 - 3n + 2) \Gamma(n-2) \mu^{n-4} - \Gamma(n) \mu^{n-2},$$

$$T(\mu)(\mu^{-\alpha-1} + \mu^{-\alpha} + \mu^{-1} + 1) = (n-1)! \mu^{n-4-\alpha} - \Gamma(n) \mu^{n-2-\alpha} + (n-1)(n-2) \Gamma(n-2) \mu^{n-4} - \Gamma(n) \mu^{n-2},$$

$$T(\mu)(\mu^{-\alpha} + 1) \mu(\mu^{-1} + 1) = (n-1)! \mu^{n-2} (\mu^{-\alpha-2} - \mu^{-\alpha} + \mu^{-2} - 1),$$

$$T(\mu)(\mu^{-\alpha} + 1)(\mu^{-1} + 1) = (n-1)! \mu^{n-2} (\mu^{-\alpha} + 1)(\mu^{-2} - 1),$$

$$T(\mu) = (n-1)! \mu^{n-2} (\mu^{-1} - 1),$$

$$T(\mu) = (n-1)! \mu^{n-3} - (n-1)! \mu^{n-2},$$

$$S^{-1}[T(\mu)] = S^{-1}[(n-1)! \mu^{n-3}] - S^{-1}[(n-1)! \mu^{n-2}],$$

$$x(t) = (n-1)t^{n-2} - t^{n-1}.$$

Abodh transformation

$$f(x) \Rightarrow K(v)$$

$$K(\nu) = A[f(x)] = \frac{1}{\nu} \int_0^{\infty} f(x) e^{-\nu x} dx.$$

$$A[x^{\beta}] = \frac{\Gamma(\beta+1)}{\nu^{\beta+2}},$$

$$A[f^{(n)}(x)] = \nu^n K(\nu) - \nu^{n-2} f(0) - \nu^{n-3} f'(0) - \dots - \frac{f^{(n-1)}(0)}{\nu},$$

$$A^{-1}[\nu^{-\beta}] = \frac{x^{\beta-2}}{\Gamma(\beta-1)}.$$

Solve equation (2) using the Aboodh transform,

$$\begin{aligned} A[D^{\alpha+1}[x(t)] + D^{\alpha}[x(t)] + x'(t) + x(t)] &= \\ &= A\left[\frac{(n-1)!}{\Gamma(n-2-\alpha)} t^{n-3-\alpha} - \frac{\Gamma(n)}{\Gamma(n-\alpha)} t^{n-1-\alpha} + (n^2 - 3n + 2)t^{n-3} - t^{n-1}\right], \\ A[D^{\alpha+1}[x(t)]] + A[D^{\alpha}[x(t)]] + A[x'(t)] + A[x(t)] &= \\ &= \frac{(n-1)!}{\Gamma(n-2-\alpha)} A[t^{n-3-\alpha}] - \frac{\Gamma(n)}{\Gamma(n-\alpha)} A[t^{n-1-\alpha}] + (n^2 - 3n + 2)A[t^{n-3}] - A[t^{n-1}], \end{aligned}$$

$$\begin{aligned} \nu^{\alpha+1} K(\nu) + \nu^{\alpha} K(\nu) + \nu K(\nu) + K(\nu) &= \\ &= \frac{(n-1)!}{\Gamma(n-2-\alpha)} \frac{\Gamma(n-2-\alpha)}{\nu^{n-1-\alpha}} - \frac{\Gamma(n)}{\Gamma(n-\alpha)} \frac{\Gamma(n-\alpha)}{\nu^{n+1-\alpha}} + \frac{(n^2 - 3n + 2)\Gamma(n-2)}{\nu^{n-1}} - \frac{\Gamma(n)}{\nu^{n+1}}, \end{aligned}$$

$$K(\nu)(\nu^{\alpha+1} + \nu^{\alpha} + \nu + 1) = \frac{(n-1)!}{\nu^{n-1-\alpha}} - \frac{\Gamma(n)}{\nu^{n+1-\alpha}} + \frac{(n-1)(n-2)\Gamma(n-2)}{\nu^{n-1}} - \frac{\Gamma(n)}{\nu^{n+1}},$$

$$K(\nu)(\nu^{\alpha} + 1)(\nu + 1) = \frac{(n-1)!}{\nu^{n+1}} (\nu^{\alpha+2} - \nu^{\alpha} + \nu^2 - 1),$$

$$K(\nu)(\nu^{\alpha} + 1)(\nu + 1) = \frac{(n-1)!}{\nu^{n+1}} (\nu^{\alpha} + 1)(\nu^2 - 1),$$

$$K(\nu) = \frac{(n-1)!}{\nu^{n+1}} (\nu - 1),$$

$$K(\nu) = \frac{(n-1)!}{\nu^n} - \frac{(n-1)!}{\nu^{n+1}},$$

$$A^{-1}[K(\nu)] = A^{-1}\left[\frac{(n-1)!}{\nu^n}\right] - A^{-1}\left[\frac{(n-1)!}{\nu^{n+1}}\right],$$

$$x(t) = (n-1)t^{n-2} - t^{n-1}.$$

Kamal transformation

$$f(x) \Rightarrow G(\nu)$$

$$G(\nu) = K[f(x)] = \int_0^{\infty} f(x) e^{-\frac{x}{\nu}} dx.$$

$$K[x^{\beta}] = \nu^{\beta+1} \Gamma(\beta+1),$$

$$K[f^{(n)}(x)] = \frac{G(\nu)}{\nu^n} - \sum_{k=0}^{n-1} \frac{f^{(k)}(0)}{\nu^{n-k-1}},$$

$$K^{-1}\left[v^{\beta+1}\right]=\frac{x^{\beta}}{\Gamma(\beta+1)}.$$

Solve equation (2) using the Kamal transform,

$$\begin{aligned} K\left[D^{\alpha+1}[x(t)]+D^{\alpha}[x(t)]+x'(t)+x(t)\right] &= \\ &= K\left[\frac{(n-1)!}{\Gamma(n-2-\alpha)}t^{n-3-\alpha}-\frac{\Gamma(n)}{\Gamma(n-\alpha)}t^{n-1-\alpha}+(n^2-3n+2)t^{n-3}-t^{n-1}\right], \\ K\left[D^{\alpha+1}[x(t)]\right]+K\left[D^{\alpha}[x(t)]\right]+K\left[x'(t)\right]+K\left[x(t)\right] &= \\ &= \frac{(n-1)!}{\Gamma(n-2-\alpha)}K\left[t^{n-3-\alpha}\right]-\frac{\Gamma(n)}{\Gamma(n-\alpha)}K\left[t^{n-1-\alpha}\right]+(n^2-3n+2)K\left[t^{n-3}\right]-K\left[t^{n-1}\right], \end{aligned}$$

$$\begin{aligned} v^{-\alpha-1}G(v)+v^{-\alpha}G(v)+v^{-1}G(v)+G(v) &= \\ &= \frac{(n-1)!}{\Gamma(n-2-\alpha)}\Gamma(n-2-\alpha)v^{n-2-\alpha}-\frac{\Gamma(n)}{\Gamma(n-\alpha)}\Gamma(n-\alpha)v^{n-\alpha}+(n^2-3n+2)\Gamma(n-2)v^{n-2}-\Gamma(n)v^n, \end{aligned}$$

$$G(v)\left(v^{-\alpha-1}+v^{-\alpha}+v^{-1}+1\right)=(n-1)!v^{n-2-\alpha}-\Gamma(n)v^{n-\alpha}+(n-1)(n-2)\Gamma(n-2)v^{n-2}-\Gamma(n)v^n,$$

$$G(v)\left(v^{-\alpha}+1\right)\left(v^{-1}+1\right)=(n-1)!v^n\left(v^{-\alpha-2}-v^{-\alpha}+v^{-2}-1\right),$$

$$G(v)\left(v^{-\alpha}+1\right)\left(v^{-1}+1\right)=(n-1)!v^n\left(v^{-\alpha}+1\right)\left(v^{-2}-1\right),$$

$$G(v)=(n-1)!v^n\left(v^{-1}-1\right),$$

$$G(v)=(n-1)!v^{n-1}-(n-1)!v^n,$$

$$K^{-1}\left[G(v)\right]=K^{-1}\left[(n-1)!v^{n-1}\right]-K^{-1}\left[(n-1)!v^n\right],$$

$$x(t)=(n-1)t^{n-2}-t^{n-1}.$$

Pourezza transformation

$$f(x) \Rightarrow F(p)$$

$$F(p)=P\left[f(x)\right]=p \int_0^{\infty} f(x) e^{-p^2 x} d x .$$

$$P\left[x^{\beta}\right]=\frac{\Gamma(\beta+1)}{p^{2 \beta+1}},$$

$$P\left[f^{(n)}(x)\right]=p^{2 n} F(p)-\sum_{k=0}^{n-1} p^{2 n-2 k-1} f^{(n)}(0),$$

$$P^{-1}\left[p^{-(2 \beta+1)}\right]=\frac{x^{\beta}}{\Gamma(\beta+1)}.$$

Solve equation (2) using the Pourezza transform,

$$\begin{aligned} P\left[D^{\alpha+1}[x(t)]+D^{\alpha}[x(t)]+x'(t)+x(t)\right] &= \\ &= P\left[\frac{(n-1)!}{\Gamma(n-2-\alpha)}t^{n-3-\alpha}-\frac{\Gamma(n)}{\Gamma(n-\alpha)}t^{n-1-\alpha}+(n^2-3n+2)t^{n-3}-t^{n-1}\right], \\ P\left[D^{\alpha+1}[x(t)]\right]+P\left[D^{\alpha}[x(t)]\right]+P\left[x'(t)\right]+P\left[x(t)\right] &= \\ &= \frac{(n-1)!}{\Gamma(n-2-\alpha)}P\left[t^{n-3-\alpha}\right]-\frac{\Gamma(n)}{\Gamma(n-\alpha)}P\left[t^{n-1-\alpha}\right]+(n^2-3n+2)P\left[t^{n-3}\right]-P\left[t^{n-1}\right], \end{aligned}$$

$$\begin{aligned}
 p^{2\alpha+2}F(p) + p^{2\alpha}F(p) + p^2F(p) + F(p) &= \\
 &= \frac{(n-1)!}{\Gamma(n-2-\alpha)} \frac{\Gamma(n-2-\alpha)}{p^{2n-5-2\alpha}} - \frac{\Gamma(n)}{\Gamma(n-\alpha)} \frac{\Gamma(n-\alpha)}{p^{2n-1-2\alpha}} + \frac{(n^2-3n+2)\Gamma(n-2)}{p^{2n-5}} - \frac{\Gamma(n)}{p^{2n-1}}, \\
 F(p)(p^{2\alpha+2} + p^{2\alpha} + p^2 + 1) &= \frac{(n-1)!}{p^{2n-5-2\alpha}} - \frac{\Gamma(n)}{p^{2n-1-2\alpha}} + \frac{(n-1)(n-2)\Gamma(n-2)}{p^{2n-5}} - \frac{\Gamma(n)}{p^{2n-1}}, \\
 F(p)(p^{2\alpha} + 1)(p^2 + 1) &= \frac{(n-1)!}{p^{2n-1}}(p^{2\alpha+4} - p^{2\alpha} + p^4 - 1), \\
 F(p)(p^{2\alpha} + 1)(p^2 + 1) &= \frac{(n-1)!}{p^{2n-1}}(p^{2\alpha} + 1)(p^4 - 1), \\
 F(p) &= \frac{(n-1)!}{p^{2n-1}}(p^2 - 1), \\
 F(p) &= \frac{(n-1)!}{p^{2n-3}} - \frac{(n-1)!}{p^{2n-1}}, \\
 P^{-1}[F(p)] &= P^{-1}\left[\frac{(n-1)!}{p^{2n-3}}\right] - P^{-1}\left[\frac{(n-1)!}{p^{2n-1}}\right], \\
 x(t) &= (n-1)t^{n-2} - t^{n-1}.
 \end{aligned}$$

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Rezyume: Maqolada kasr tartibli differensial tenglamalarni integral almashtirishlar yordamida yechish ko'rib chiqiladi.

Резюме: В работе рассматривается решение дифференциальных уравнений дробного порядка с помощью интегральных преобразований.

Kalit sózlar: kasr tartibli differensial tenglamalar, integral almashtirishlar, umumiy yechim,

Ключевые слова: дифференциальные уравнения дробного порядка, интегральные преобразования, общее решение.

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METHODS FOR SOLVING THE INITIAL–BOUNDARY VALUE PROBLEM FOR THE WAVE EQUATION USING INTEGRAL TRANSFORMATIONS

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Summary: In this work, using the method of direct and inverse integral transformations of Fourier and Laplas, as well as using the continuation, solutions of initial boundary value problems for the wave equation on the semi–axis are obtained.

Key words: equation of free vibration of a string, initial boundary value problem, convolution of functions, direct and inverse integral Fourier and Laplace transforms.

INTRODUCTION. In modern methods of solving initial–boundary value problems for a one–dimensional wave equation, the Fourier and Laplace integral transformations are effectively used. In particular, under the action of the Fourier transform, the operation of differentiation by x is replaced by multiplication, and the Laplace transform replaces the operation of differentiation by t a time variable by multiplication. These important facts are used in solving partial differential equations.

To solve such a problem, one proceeds by variable x (by variable t) using the Fourier transform (Laplace transform) to the problem for the image $\bar{u}(\lambda, t)$ (for the transformant $\bar{u}(\lambda, p)$). Having solved this simpler problem, they find the function $u(x, t)$ using the inverse Fourier transform or Laplace transform.

Let's consider some typical examples of the application of integral Fourier and Laplace transformations.

Example. It is required to find a limited solution $u(x, t)$ $t \geq 0$, $x > 0$ to the equation of free oscillation of a thin string that satisfies some initial conditions and a boundary condition set at one of the ends of the string:

$$u_{tt} = a^2 u_{xx}, \quad x > 0, \quad t > 0, \quad (1a)$$

$$u(x, 0) = u_0(x), \quad u_t(x, 0) = 0, \quad x \geq 0, \quad (2a)$$

$$u_x(0, t) - hu(0, t) = 0, \quad h = \text{const}, \quad t \geq 0. \quad (3a)$$

Here $u_0(x)$ is the initial shape of the string, the function $u(x, t)$ and its derivative by x tend to zero.

1–method. To solve this problem on a semi–direct basis, we apply the integral Fourier transform with a kernel

$$K(x, \lambda) = \sqrt{\frac{2}{\pi}} \cdot \frac{\lambda \cos \lambda x + h \sin \lambda x}{\lambda^2 + h^2}.$$

In this case, the Fourier image of a function $u(x, t)$ with such a kernel has the form

$$\bar{u}(\lambda, t) = \sqrt{\frac{2}{\pi}} \int_0^{+\infty} u(\xi, t) \left(\frac{\lambda \cos \lambda \xi + h \sin \lambda \xi}{\lambda^2 + h^2} \right) d\xi. \quad (4a)$$

Multiply both parts of the equation

$$\frac{\partial^2 u(\xi, t)}{\partial t^2} = a^2 \frac{\partial^2 u(\xi, t)}{\partial \xi^2}$$

on $\sqrt{\frac{2}{\pi}} \cdot \frac{\lambda \cos \lambda x + h \sin \lambda x}{\lambda^2 + h^2}$ and we integrate by ξ from 0 to $+\infty$, applying integration in parts and using a boundary condition $u'_\xi(0, t) - hu(0, t) = 0$; this gives:

$$\begin{aligned} & \sqrt{\frac{2}{\pi}} \int_0^{+\infty} \frac{\partial^2 u(\xi, t)}{\partial t^2} \left(\frac{\lambda \cos \lambda \xi + h \sin \lambda \xi}{\lambda^2 + h^2} \right) d\xi = \frac{d^2 \bar{u}(\lambda, t)}{dt^2}, \\ & a^2 \sqrt{\frac{2}{\pi}} \int_0^{+\infty} \frac{\partial^2 u(\xi, t)}{\partial \xi^2} \left(\frac{\lambda \cos \lambda \xi + h \sin \lambda \xi}{\lambda^2 + h^2} \right) d\xi = \\ & = \frac{a^2}{\lambda^2 + h^2} \sqrt{\frac{2}{\pi}} \cdot \left[\frac{\partial u(\xi, t)}{\partial \xi} (\lambda \cos \lambda \xi + h \sin \lambda \xi) \Big|_{\xi=0}^{\xi=+\infty} - \right. \\ & \quad \left. - \int_0^{+\infty} \frac{\partial u(\xi, t)}{\partial \xi} (\lambda h \cos \lambda \xi - \lambda^2 \sin \lambda \xi) d\xi \right] = \\ & = \frac{a^2}{\lambda^2 + h^2} \sqrt{\frac{2}{\pi}} \cdot \left[-\lambda \frac{\partial u(0, t)}{\partial \xi} - u(\xi, t) (\lambda h \cos \lambda \xi - \lambda^2 \sin \lambda \xi) \Big|_{\xi=0}^{\xi=+\infty} + \right. \\ & \quad \left. + \int_0^{+\infty} u(\xi, t) (-\lambda^2 h \sin \lambda \xi - \lambda^3 \cos \lambda \xi) d\xi \right] = \\ & = \frac{a^2}{\lambda^2 + h^2} \sqrt{\frac{2}{\pi}} \cdot \left[-\lambda u'_\xi(0, t) + \lambda h u(0, t) - \lambda^2 \int_0^{+\infty} u(\xi, t) (\lambda \cos \lambda \xi + h \sin \lambda \xi) d\xi \right] = \\ & = -\lambda^2 a^2 \sqrt{\frac{2}{\pi}} \cdot \int_0^{+\infty} u(\xi, t) \left(\frac{\lambda \cos \lambda \xi + h \sin \lambda \xi}{\lambda^2 + h^2} \right) d\xi = -(a\lambda)^2 \bar{u}(\lambda, t). \end{aligned}$$

At the same time, we take advantage of the fact that $u(\xi, t)$ and $\frac{\partial u(\xi, t)}{\partial \xi}$ tend to zero quite quickly at $\xi \rightarrow +\infty$. Hence, for the integral expression (4a), we obtain an ordinary second-order differential equation of the form

$$\frac{d^2 \bar{u}(\lambda, t)}{dt^2} + (a\lambda)^2 \bar{u}(\lambda, t) = 0. \quad (5a)$$

When $t = 0$ we get:

$$\begin{aligned} \bar{u}(\lambda, 0) &= \sqrt{\frac{2}{\pi}} \int_0^{+\infty} u(\xi, 0) \left(\frac{\lambda \cos \lambda \xi + h \sin \lambda \xi}{\lambda^2 + h^2} \right) d\xi = \\ &= \sqrt{\frac{2}{\pi}} \int_0^{+\infty} u_0(\xi) \left(\frac{\lambda \cos \lambda \xi + h \sin \lambda \xi}{\lambda^2 + h^2} \right) d\xi = \bar{u}_0(\lambda), \end{aligned} \quad (6a)$$

$$\bar{u}_t(\lambda, 0) = \sqrt{\frac{2}{\pi}} \int_0^{+\infty} \frac{\partial u(\xi, t)}{\partial t} \left(\frac{\lambda \cos \lambda \xi + h \sin \lambda \xi}{\lambda^2 + h^2} \right) d\xi = 0. \quad (7a)$$

Taking into account the initial conditions (6a) and (7a) gives the following solution to the Cauchy problem (5a)–(7a):

$$\bar{u}(\lambda, t) = \bar{u}_0(\lambda) \cos(a\lambda t). \quad (8a)$$

Now we present the following important lemma without proof.

1–lemma. For the integral transformation

$$\bar{u}(\lambda, t) = \sqrt{\frac{2}{\pi}} \int_0^{+\infty} u(\xi, t) \left(\frac{\lambda \cos \lambda \xi + h \sin \lambda \xi}{\lambda^2 + h^2} \right) d\xi$$

the following conversion formula takes place

$$u(x, t) = \sqrt{\frac{2}{\pi}} \int_0^{+\infty} \bar{u}(\lambda, t) (\lambda \cos \lambda x + h \sin \lambda x) d\lambda. \quad (9a)$$

To solve the boundary value problem for $u(x, t)$ using the integral Fourier transform, we proceed by variable x to the problem for the Fourier image of this function, then we find this image. After that, using the inverse Fourier transform, we "restore the original", i.e. we find the function according to its Fourier image.

Using the following formula, we proceed to restore the "original":

$$\begin{aligned} u(x, t) &= \sqrt{\frac{2}{\pi}} \int_0^{+\infty} \bar{u}_0(\lambda) \cos(a\lambda t) \cdot (\lambda \cos \lambda x + h \sin \lambda x) d\lambda = \\ &= \frac{2}{\pi} \int_0^{+\infty} \cos(a\lambda t) \cdot (\lambda \cos \lambda x + h \sin \lambda x) \left(\int_0^{+\infty} u_0(\xi) \left(\frac{\lambda \cos \lambda \xi + h \sin \lambda \xi}{\lambda^2 + h^2} \right) d\xi \right) d\lambda = \\ &= \frac{2}{\pi} \int_0^{+\infty} u_0(\xi) \left[\int_0^{+\infty} \cos(a\lambda t) \cdot (\lambda \cos \lambda x + h \sin \lambda x) \left(\frac{\lambda \cos \lambda \xi + h \sin \lambda \xi}{\lambda^2 + h^2} \right) d\lambda \right] d\xi. \end{aligned}$$

Next, you need to convert the integrand, i.e.

$$\begin{aligned} &(\lambda \cos \lambda x + h \sin \lambda x) \left(\frac{\lambda \cos \lambda \xi + h \sin \lambda \xi}{\lambda^2 + h^2} \right) = \\ &= \frac{\lambda^2 \cos \lambda x \cos \lambda \xi + \lambda h \cos \lambda x \sin \lambda \xi + \lambda h \sin \lambda x \cos \lambda \xi + h^2 \sin \lambda x \sin \lambda \xi}{\lambda^2 + h^2} = \\ &= \cos \lambda x \cos \lambda \xi + \frac{\lambda h \sin \lambda(x + \xi) - h^2 \cos \lambda(x + \xi)}{\lambda^2 + h^2} = \\ &= \frac{1}{2} (\cos \lambda(x + \xi) + \cos \lambda(x - \xi)) + \frac{\lambda h \sin \lambda(x + \xi) - h^2 \cos \lambda(x + \xi)}{\lambda^2 + h^2}. \end{aligned} \quad (10a)$$

Let's consider two cases:

1) $x - at > 0$. Then

$$\begin{aligned} J_1 &= \frac{1}{2} \int_0^{+\infty} \cos(a\lambda t) \cdot [\cos \lambda(x + \xi) + \cos \lambda(x - \xi)] d\lambda = \\ &= \frac{1}{2} \int_0^{+\infty} \cos(a\lambda t) \cdot \cos \lambda(x + \xi) d\lambda + \frac{1}{2} \int_0^{+\infty} \cos(a\lambda t) \cdot \cos \lambda(x - \xi) d\lambda = \\ &= \frac{1}{4} \int_0^{+\infty} [\cos \lambda(\xi + (x - at)) + \cos \lambda(\xi + x + at)] d\lambda + \\ &+ \frac{1}{4} \int_0^{+\infty} [\cos \lambda(\xi - (x + at)) + \cos \lambda(\xi - (x - at))] d\lambda, \end{aligned}$$

then, given the integral representation of the δ – Dirac function

$$\delta(x - x_0) = \frac{1}{\pi} \int_0^{+\infty} \cos \lambda(x - x_0) d\lambda, \quad (11a)$$

we will have

$$\int_0^{+\infty} \cos(a\lambda t) \cdot \cos \lambda(x + \xi) d\lambda = \frac{\pi}{2} [\delta(\xi + x + at) + \delta(\xi + (x - at))],$$

$$\int_0^{+\infty} \cos(a\lambda t) \cdot \cos \lambda(x - \xi) d\lambda = \frac{\pi}{2} [\delta(\xi - (x + at)) + \delta(\xi - (x - at))]$$

and therefore,

$$\begin{aligned} J_1 &= \frac{1}{2} \int_0^{+\infty} \cos(a\lambda t) \cdot [\cos \lambda(x + \xi) + \cos \lambda(x - \xi)] d\lambda = \\ &= \frac{\pi}{4} [\delta(\xi + x + at) + \delta(\xi + (x - at))] + \frac{\pi}{4} [\delta(\xi - (x + at)) + \delta(\xi - (x - at))]; \\ J_2 &= \frac{2}{\pi} \int_0^{+\infty} \cos(a\lambda t) \cdot \frac{\lambda \sin \lambda(x + \xi)}{\lambda^2 + h^2} d\lambda = \\ &= \frac{1}{\pi} \int_0^{+\infty} \frac{\lambda}{\lambda^2 + h^2} \cdot [\sin \lambda(x + \xi - at) + \sin \lambda(x + \xi + at)] d\lambda = \frac{1}{2} [e^{-h(\xi + x - at)} + e^{-h(\xi + x + at)}]; \\ J_3 &= \frac{2}{\pi} \int_0^{+\infty} \cos(a\lambda t) \cdot \frac{\cos \lambda(x + \xi)}{\lambda^2 + h^2} d\lambda = \\ &= \frac{1}{\pi} \int_0^{+\infty} \frac{1}{\lambda^2 + h^2} \cdot [\cos \lambda(x + \xi - at) + \cos \lambda(x + \xi + at)] d\lambda = \frac{1}{2h} [e^{-h(\xi + x - at)} + e^{-h(\xi + x + at)}]; \\ u(x, t) &= \frac{1}{2} \int_0^{+\infty} u_0(\xi) [\delta(\xi + x + at) + \delta(\xi + (x - at))] d\xi + \\ &+ \frac{1}{2} \int_0^{+\infty} u_0(\xi) [\delta(\xi - (x + at)) + \delta(\xi - (x - at))] d\xi + \\ &+ \frac{h}{2} \int_0^{+\infty} u_0(\xi) \{ [e^{-h(\xi + x - at)} + e^{-h(\xi + x + at)}] - [e^{-h(\xi + x - at)} + e^{-h(\xi + x + at)}] \} d\xi. \end{aligned}$$

Since $\delta(\xi + x + at) \equiv 0$ and $\delta(\xi + x - at) \equiv 0$ at $x - at > 0$, we finally get

$$u(x, t) = \frac{1}{2} [u_0(x + at) + u_0(x - at)], \quad x - at > 0. \quad (12a)$$

2) If $x - at < 0$, then we have:

$$\begin{aligned} J_1^* &= \frac{1}{2} \int_0^{+\infty} \cos(a\lambda t) \cdot [\cos \lambda(x + \xi) + \cos \lambda(x - \xi)] d\lambda = \\ &= \frac{\pi}{4} [\delta(\xi + x + at) + \delta(\xi - (at - x))] + \frac{\pi}{4} [\delta(\xi - (x + at)) + \delta(\xi + (at - x))]; \\ J_2^* &= \frac{2}{\pi} \int_0^{+\infty} \cos(a\lambda t) \cdot \frac{\lambda \sin \lambda(x + \xi)}{\lambda^2 + h^2} d\lambda = \\ &= \frac{1}{\pi} \int_0^{+\infty} \frac{\lambda}{\lambda^2 + h^2} \cdot [-\sin \lambda(at - x - \xi) + \sin \lambda(at + x + \xi)] d\lambda = \frac{1}{2} [-e^{-h(at - x - \xi)} + e^{-h(at + x + \xi)}]; \\ J_3^* &= \frac{2}{\pi} \int_0^{+\infty} \cos(a\lambda t) \cdot \frac{\cos \lambda(x + \xi)}{\lambda^2 + h^2} d\lambda = \\ &= \frac{1}{\pi} \int_0^{+\infty} \frac{1}{\lambda^2 + h^2} \cdot [\cos \lambda(at - x - \xi) + \cos \lambda(at + x + \xi)] d\lambda = \frac{1}{h} [e^{-h(at - x - \xi)} + e^{-h(at + x + \xi)}]; \\ u(x, t) &= \frac{1}{2} \int_0^{+\infty} u_0(\xi) [\delta(\xi + x + at) + \delta(\xi - (at - x))] d\xi + \end{aligned}$$

$$+ \frac{1}{2} \int_0^{+\infty} u_0(\xi) [\delta(\xi - (x + at)) + \delta(\xi + (at - x))] d\xi +$$

$$+ \frac{h}{2} \int_0^{+\infty} u_0(\xi) \left\{ \left[-e^{-h(at - x - \xi)} + e^{-h(at + x + \xi)} \right] - \left[e^{-h(at - x - \xi)} + e^{-h(at + x + \xi)} \right] \right\} d\xi.$$

Since $\delta(\xi + x + at) \equiv 0$ and $\delta(\xi + (at - x)) \equiv 0$ at $x - at < 0$, therefore we get

$$u(x, t) = \frac{1}{2} [u_0(x + at) + u_0(at - x)] - h \int_0^{at - x} u_0(\xi) e^{-h(at - x - \xi)} d\xi =$$

$$= \frac{1}{2} [u_0(x + at) + u_0(at - x)] - h e^{h(x - at)} \int_0^{at - x} u_0(\xi) e^{h\xi} d\xi. \quad (13a)$$

Combining the results obtained, the desired solution of the initial boundary value problem (1a)–(3a) can be written as:

$$u(x, t) = \begin{cases} \frac{1}{2} [u_0(x + at) + u_0(x - at)], & x - at \geq 0, \\ \frac{1}{2} [u_0(x + at) + u_0(at - x)] - \\ - h e^{h(x - at)} \int_0^{at - x} u_0(\xi) e^{h\xi} d\xi, & x - at < 0. \end{cases}$$

Example. Initial deviations $u(x, 0) = u_0(x)$ are reported to the cross sections of a semi-bounded elastic rod with an elastically fixed end ($x = 0$), while the initial velocities are zero. Find the longitudinal deviations $u(x, t)$ of the cross sections of the rod at $t > 0$.

$$u_{tt} = a^2 u_{xx}, \quad x > 0, \quad t > 0, \quad (1b)$$

$$u(x, 0) = u_0(x), \quad u_t(x, 0) = 0, \quad x \geq 0, \quad (2b)$$

$$u_x(0, t) - \beta u(0, t) = 0, \quad \beta = \text{const}, \quad t \geq 0. \quad (3b)$$

2–method. We will look for the solution of equation (1b) in the form

$$u(x, t) = f(x - at) + g(x + at). \quad (4b)$$

Since the initial conditions are set at $x \geq 0$, then the functions $f(x)$, $g(x)$ are for $x \geq 0$. And since the solution is then written out for $f(x - at) + g(x + at)$, then the solution found takes place in the area where $x + at \geq 0$, $x - at \geq 0$. This area is usually called a zone I. This area is under the "main" characteristic $x - at = 0$. The characteristic $x - at = 0$ is called the main one because it comes from a special angular point of the region $x > 0$, $t > 0$, where equation (1b) is solved.

At the same time, it turns out that $x + at \geq 0$ for the entire first quarter, where it is necessary to find a solution to the problem, and therefore it $g(x + at)$ was determined in the entire given area.

The solution of the mixed problem (1b)–(3b) is given by the D'Alembert formula at $x - at > 0$, i.e.

$$u(x, t) = \frac{1}{2} [u_0(x + at) + u_0(x - at)]. \quad (5b)$$

Now let's find a solution over the main characteristic (in the area $x - at < 0$), i.e. in the zone II.

Decomposition (4b) is valid everywhere in the domain $x > 0$, $t > 0$. However, the wave $f(x - at)$ is found only in the region $x - at > 0$, i.e. under the main characteristic. At the same time,

the wave $g(x+at) = \frac{1}{2}u_0(x+at)$ is found everywhere. Thus, it remains to find $f(x-at)$ over the main characteristic. Therefore, you need to look for a solution at $x < at$ in the form of

$$u(x, t) = f(x-at) + \frac{1}{2}u_0(x+at), \quad (6b)$$

substituting this expression into the boundary condition (3b), we find:

$$\begin{aligned} u_x(x, t) &= f'(x-at) + \frac{1}{2}u'_0(x+at), \\ f'(-at) + \frac{1}{2}u'_0(at) - \beta \cdot f(-at) - \frac{1}{2}\beta \cdot u_0(at) &= 0. \end{aligned} \quad (7b)$$

After the replacement $-at = y$, we get:

$$f'(y) - \beta \cdot f(y) = \frac{1}{2}[\beta \cdot u_0(-y) - u'_0(-y)].$$

From here

$$f(y) = e^{\int \beta dy} \left(C + \frac{1}{2} \int_0^y [\beta \cdot u_0(-s) - u'_0(-s)] e^{-\int \beta ds} ds \right), \quad C = \text{const.}$$

By replacing the variable $-s = t$ in the integral expression, we get

$$f(y) = e^{\beta y} \left(C - \frac{1}{2} \int_0^{-y} [\beta \cdot u_0(t) - u'_0(t)] e^{\beta t} dt \right).$$

Then, using the piecemeal integration rule, we transform the integral

$$\begin{aligned} f(y) &= e^{\beta y} \left(C - \frac{1}{2} \int_0^{-y} [\beta \cdot u_0(t) - u'_0(t)] e^{\beta t} dt \right) = \left| \begin{array}{ll} u = e^{\beta t} & du = \beta e^{\beta t} dt \\ dv = u'_0(t) dt & v = u_0(t) \end{array} \right| = \\ &= e^{\beta y} \left(C + \frac{1}{2} u_0(-y) e^{-\beta y} - \frac{1}{2} u_0(0) - \beta \int_0^{-y} u_0(t) e^{\beta t} dt \right). \end{aligned}$$

Then the expression for $f(x-at)$ is reduced to the form:

$$\begin{aligned} f(x-at) &= C e^{\beta(x-at)} + \\ &+ \frac{1}{2} u_0(at-x) - \frac{1}{2} u_0(0) e^{\beta(x-at)} - \beta e^{\beta(x-at)} \int_0^{at-x} u_0(t) e^{\beta t} dt. \end{aligned} \quad (8b)$$

Thus, we obtained an explicit form of the function $u(x, t)$ defined by a given initial function $u_0(x)$ when $x < at$:

$$\begin{aligned} u(x, t) &= C e^{\beta(x-at)} + \frac{1}{2} u_0(at-x) - \frac{1}{2} u_0(0) e^{\beta(x-at)} - \\ &- \beta e^{\beta(x-at)} \int_0^{at-x} u_0(t) e^{\beta t} dt + \frac{1}{2} u_0(x+at). \end{aligned} \quad (9b)$$

Finally, we find a constant C from the condition of continuity of the solution of the problem in the domain $\{(x, t): x > 0, t > 0\}$. To do this, we will "glue" the continuity of solutions given by formulas (5b) and (9b) in the corresponding regions, on the common boundary of these regions, i.e. on the characteristic $x-at=0$:

$$C + \frac{1}{2} u_0(2at) = \frac{1}{2} u_0(0) + \frac{1}{2} u_0(2at).$$

It follows that

$$C = \frac{1}{2} u_0(0).$$

Combining the obtained results, the desired solution of the initial boundary value problem (1b)–(3b) can be written as:

$$u(x, t) = \begin{cases} \frac{1}{2} [u_0(x + at) + u_0(x - at)], & x - at \geq 0, \\ \frac{1}{2} [u_0(x + at) + u_0(at - x)] - \\ - \beta e^{\beta(x - at)} \int_0^{at - x} u_0(\xi) e^{\beta\xi} d\xi, & x - at < 0. \end{cases}$$

Example. It is required to find a solution $u(x, t)$ to the wave equation on a semi-direct

$$u_{tt} = a^2 u_{xx}, \quad x > 0, \quad t > 0, \quad (1c)$$

$$u(x, 0) = u_0(x), \quad u_t(x, 0) = 0, \quad x \geq 0, \quad (2c)$$

$$u_x(0, t) - \beta u(0, t) = 0, \quad \beta = \text{const}, \quad t \geq 0, \quad (3c)$$

where $u_0 \in C^2(x \geq 0)$, $u'_0(0) + \beta u_0(0) = 0$ is the self-consistency condition, $u, u_x|_{x \rightarrow +\infty} = 0$ are the emission conditions.

3–method. Let's consider the solution of this problem of oscillation of a semi-infinite string using the Fourier transform, then apply the integral Laplace transform to the expressions found.

First applying the Fourier transform with the kernel

$$\bar{u}(\lambda, t) = \sqrt{\frac{2}{\pi}} \int_0^{+\infty} u(\xi, t) \left(\frac{\lambda \cos \lambda \xi + h \sin \lambda \xi}{\lambda^2 + h^2} \right) d\xi \quad (4c)$$

for the transformant $\bar{u}(\lambda, t)$, we obtain an ordinary second-order differential equation of the form

$$\bar{u}_{tt}(\lambda, t) + (a\lambda)^2 \bar{u}(\lambda, t) = 0. \quad (5c)$$

We are well aware that the Laplace transform is convenient for a time variable t . Further, considering the following ratios

$$f'(t) \square p F(p) - f(0), \quad f''(t) \square p^2 F(p) - p f(0) - f'(0),$$

it is possible to write the equation for the tracerformant $\bar{\bar{u}}(\lambda, p)$ of the Fourier transform $\bar{u}(\lambda, t)$, i.e.

$$p^2 \bar{\bar{u}}(\lambda, p) - p \bar{u}_0(\lambda) + (a\lambda)^2 \bar{\bar{u}}(\lambda, p) = 0, \quad (6c)$$

where

$$u(x, 0) = u_0(x) \Rightarrow \bar{u}(\lambda, 0) = \bar{u}_0(\lambda), \quad u_t(x, 0) = 0 \Rightarrow \bar{u}_t(\lambda, 0) = 0.$$

From (6c) we have an algebraic equation of the first order

$$\bar{\bar{u}}(\lambda, p) = \frac{p \bar{u}_0(\lambda)}{p^2 + \lambda^2 a^2}. \quad (7c)$$

Next, performing the Laplace transformations in reverse order, we find

$$\begin{aligned} \bar{u}_0(\lambda, 0) \square \bar{u}_0(\lambda), \quad \cos(a\lambda t) \square \frac{p}{p^2 + \lambda^2 a^2}, \\ \bar{u}(\lambda, t) = \bar{u}_0(\lambda) \cos a\lambda t. \end{aligned} \quad (8c)$$

Now we need to substitute (8c) into the expression (9a). Therefore

$$u(x, t) = \sqrt{\frac{2}{\pi}} \int_0^{+\infty} \bar{u}_0(\lambda) \cos a\lambda t \cdot [\lambda \cos \lambda x + h \sin \lambda x] d\lambda. \quad (9c)$$

Further calculations are completely similar as in the 1–method, so we will write out the final answer to this problem, i.e.

$$u(x, t) = \begin{cases} \frac{1}{2} [u_0(x + at) + u_0(x - at)], & x - at \geq 0, \\ \frac{1}{2} [u_0(x + at) + u_0(at - x)] - \\ - \beta e^{\beta(x - at)} \int_0^{at - x} u_0(\xi) e^{\beta\xi} d\xi, & x - at < 0. \end{cases}$$

CONCLUSION. The results obtained can be used in the theory of linear differential and integral operators, in mathematical physics when integrating nonlinear equations.

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Rezyume: Ushbu maqolada Furiye va Laplasning to'g'ri va teskari integral almashtirishlari usullarida foydalangan holda, shuningdek davom etish usuli orgali, yarim o'qdag to'lqin tenglamasi uchun boshlang'ich–chegaraviy masalarining yechimlari topilgan.

Резюме: В данной работе методом прямого и обратного интегральных преобразований Фурье и Лапласа, а также с помощью продолжения получены решения начально–краевых задач для волнового уравнения на полуоси.

Kalit so'zlar: torning erkin tebranish tenglamasi, boshlang'ich–chegaraviy masala, funksiyalar o'ramasi, to'g'ri va teskari Furiye va Laplas almashtirishlari.

Ключевые слова: уравнение свободного колебания струны, начально-граничная задача, свертка функций, прямое и обратное интегральные преобразования Фурье и Лапласа.

A MODERN SYSTEM OF MONITORING THE STABILITY OF QUARRY SHAFTS

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Summary: *Currently, one of the rapidly developing industries in the countries of the world is the mining industry. We will certainly need new techniques and technologies to open mines. In this case, the main thing for us is the ability to ensure stability and strengthening of quarry boards. We can say that the MSR radar system is currently the most convenient. The MSR radar system is required for monitoring in hazardous areas of mining (drilling and blasting, loading and mining operations, cleaning, berms and slopes) to ensure the safety of people and machines. The use of the MSR radar system is especially effective in enterprises that use the automated dispatching system of the "quarry" mine-transport complex, because the system automatically informs about the occurrence of dangerous situations for equipment and personnel.*

Key words: *Quarry, mining, board, mine, man-made, deformation, radar.*

The importance of modern technologies in providing continuous monitoring and forecasting of the stability of quarry boards and overturning boards in the open mining of mineral deposits, their sudden fall, landslides and disasters has been studied. Such dangerous man-made accidents can lead to injury and death of mining workers. Otherwise, it will lead to restriction of transport access to the quarries. This disaster, landslides, thus disrupts the rhythm of production and leads to a decrease in the productivity of the complex of mining enterprises.

Long-term practices of mining enterprises show that small movements or changes in the model of the observed piece of quarry boards almost always appeared several hours before their collapse. In order to reliably ensure safe working conditions for workers and the use of equipment in quarries, they must be equipped with an integrated system for monitoring and controlling the displacement of pits and boards. One of the main elements of such a system is a radar monitoring system, which ensures maximum efficiency and reliability of detecting the smallest deformations and displacements.

Among the most advanced technologies are radar detectors based on the use of Reutech Mining's MSR radar (Movement & Surveying Radar). The Reutech Mining company located in Stellenbosch (South Africa) has been engaged in the development and application of radar systems for 25 years. At present, the company has 160 engineers and technicians, and the production complies with the ISO 9001 standard. The company's clients were international and local security and mining enterprises.

MSR radars do not require access to the studied slope (quarry slopes, slope slopes), because they can work at long and short distances with a high scanning speed, day and night in any weather conditions (including during rain). For example, the MSR 200 can operate at a distance of 1200 m, while the MSR 300 can operate at a distance of 2500 m.

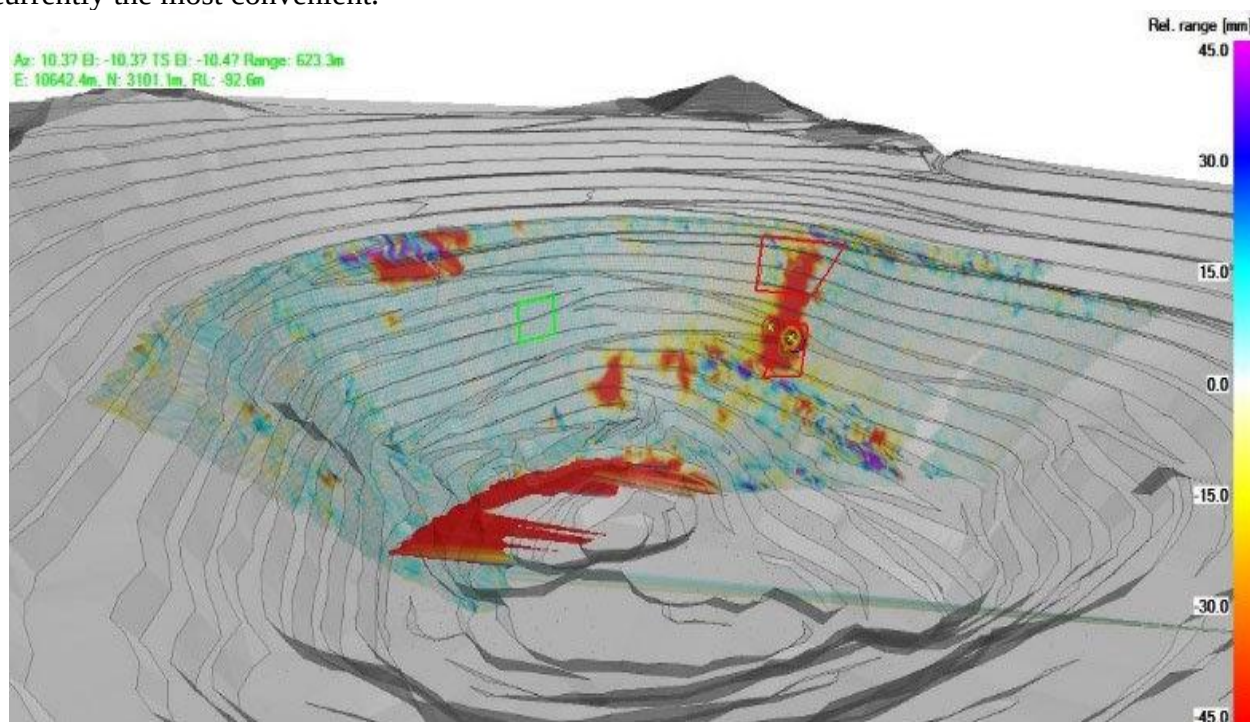
The radar of the MSR system monitors the movement of the quarry boards and slats (detection of movement less than 1 mm) and delivers an alarm message in time. Therefore, quarry workers and equipment can be removed from the hazardous area in advance. Typically, radar covers are the first to alert geomechanical engineers of a potential problem and provide immediate evacuation of mine personnel and equipment from the highest-risk area.

The second essential function of MSR is to determine the exact distance to a geophysical surface or geographic object. This function, together with a precise connection to the local coordinate system and angular data, can be used to generate surveying data, and at the same time to solve other problems, for example, to calculate the volumes of open (mining) areas (Fig. 1).

Because the MSR system has high accuracy and reliability of measuring equipment, it has a technical readiness factor close to 100% and can work in harsh climatic conditions (from -50° to +55°C). because it provides the possibility, it fully meets the requirements of controlling the

stability of career boards (not too early and not too late) and, most importantly, it can be integrated into existing systems.

The mining industry is one of the fastest growing industries in the world. Including, it is safe to say that this indicator is increasing day by day in our country. The reason is that there are many unexplored mineral deposits in the field of mining, and we will definitely need new techniques and technologies to open these deposits. In this case, the most important thing for us is to ensure the stability of quarry boards and the ability to fix them. We can say that the MSR radar system is currently the most convenient.



Picture 1. Surveillance area of the radar system.

Taking into account all of the above, we can conclude that the MSR radar system can be used for monitoring in hazardous areas mining (drilling and blasting, loading and mining operations, cleaning, berms and slopes) safe conditions of people and machines requires constant control to ensure. The use of the MSR radar system is especially effective in enterprises that use the automated dispatching system of the "quarry" mine-transport complex, because the system automatically informs about the occurrence of dangerous situations for equipment and personnel.

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Rezyume: Hozirgi kunda dunyo mamlakatlarida jadal suratda rivojlanib borayotgan sohalarning biri konchilik sohasi hisoblanadi. Konlarni ochishda bizga, albatta, yangicha texnika va texnologiyalar zurur bo'ladi. Bunda bizga asosiysi karyer bortlari turg'inligini taminlash va mustahkamlash ilojlari eng abzal tomoni hisoblanadi. Biz bunda hozirgi kunda eng qulayli bo'lgan

MSR radar tizimini aytishimizga bo'ladi. MSR radiolokatsion tizimidan xavfli sohalarda nazorat qilish uchun tog'-kon (burg'ilash va portlatish, yuklash va qazib olish ishlari, tozalash, berma va qiyaliklari) odamlar va mashinalarning xavfsiz shart-sharoitlarini ta'minlash uchun barqaror nazorat taqozo etiladi. Ayniqsa, "karyer" kon-transport kompleksining avtomatlashtirilgan dispetcherlik tizimidan foydalanadigan korxonalarda MSR radar tizimidan foydalanish samarador, sababi texnika va xodimlar xavfli holatlarning yuzaga kelishi haqida tizim orqali avtomatik tarzda xabar etiladi.

Резюме: Горнодобывающая промышленность является одной из наиболее быстро развивающихся отраслей в мире. Нам, безусловно, понадобятся новые методы и технологии для открытия шахт. В этом случае для нас главное – возможность обеспечить устойчивость и укрепление карьерных досок. Можно сказать, что радиолокационная система MSR на данный момент является наиболее удобной. Радарная система MSR необходима для мониторинга на опасных участках горных работ (буровзрывные, погрузочные и горные работы, очистка, бермы и откосы) для обеспечения безопасности людей и техники. Использование радиолокационной системы МСР особенно эффективно на предприятиях, использующих автоматизированную систему диспетчеризации горнотранспортного комплекса «Карьер», поскольку система автоматически информирует о возникновении опасных ситуаций для техники и персонала.

Kalit so'zlar: Karyer, tog'-kon, bort, pag'ona, kon, texnogen, deformatsiya, radar.

Ключевые слова: Карьер, добыча полезных ископаемых, борт, шахта, горизонт, техногенная, деформация, радар.

ANALYSIS OF RECURRENT NEURAL NETWORKS

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Summary: Recurrent Neural Networks remain a foundational technology for sequential data processing despite advancements in other neural network architectures. This paper provides a detailed comparative analysis of various RNN architectures, explores novel applications, and integrates cutting-edge techniques to address traditional limitations. Additionally, advanced training methodologies, interpretability, and performance optimizations are discussed, paving the way for future innovations in the field.

Keywords: recurrent neural networks, long short-term memory, gated recurrent unit, sequential data processing, attention mechanisms, time series prediction, model interpretability.

Introduction.

Recurrent Neural Networks (RNNs) are a type of neural network where the connections between neurons form a cycle, allowing information to persist. This characteristic makes RNNs particularly effective for sequential tasks where the order of inputs is critical [1]. Examples include language modeling, machine translation, and video analysis. Unlike feedforward neural networks, RNNs can use their internal state (memory) to process sequences of inputs, making them ideal for tasks involving temporal dependencies [1, 2]. Recurrent Neural Networks (RNNs) are crucial for tasks involving sequential data. While many advancements have been made since their inception, RNNs continue to evolve with novel architectures and applications. This paper aims to provide a comprehensive review of current RNN technologies, integrating recent advancements and highlighting future directions [3].

1. Architecture of RNN

This section delves into a comparative analysis of vanilla RNNs, LSTMs, and GRUs, providing insights into their performance, computational efficiency, and resilience against the vanishing gradient problem. RNNs consist of input, hidden, and output layers [3]. The key differentiator is the presence of recurrent connections in the hidden layer. Mathematically, the hidden state h_t at time step t is computed as:

$$h_t = \sigma(W_{hh}h_{t-1} + W_{xh}x_t + b_h)$$

where x_t is the input at time step t , W_{hh} and W_{xh} are weight matrices, b_h is a bias vector, and σ is a non-linear activation function such as *tanh* or *ReLU* [4]. The output y_t is then computed as:

$$y_t = \phi(W_{hy}h_t + b_y)$$

where W_{hy} is the weight matrix for the hidden-to-output connection and ϕ is the output activation function.

2. Types of RNN

Here, we discuss how attention mechanisms and transformers enhance RNN capabilities, supported by empirical studies and real-world application cases. Various types of RNNs have been developed to address specific challenges associated with standard RNNs:

2.1. Long Short-Term Memory (LSTM) Networks

LSTM networks are designed to combat the vanishing gradient problem prevalent in standard RNNs [1]. They incorporate memory cells and gating mechanisms (input, forget, and output gates) to maintain long-term dependencies. The memory cell c_t and hidden state h_t are updated as:

$$i_t = \sigma(W_{xi}x_t + W_{hi}h_{t-1} + b_i)$$

$$f_t = \sigma(W_{xf}x_t + W_{hf}h_{t-1} + b_f)$$

$$\begin{aligned}o_t &= \sigma(W_{xo}x_t + W_{ho}h_{t-1} + b_o) \\ \hat{c}_t &= \tanh(W_{xc}x_t + W_{hc}h_{t-1} + b_c) \\ c_t &= f_t \odot c_{t-1} + i_t \odot \hat{c}_t \\ h_t &= o_t \odot \tanh(c_t)\end{aligned}$$

2.2. Gated Recurrent Unit (GRU) Networks

GRUs are a simplified version of LSTMs that combine the input and forget gates into a single update gate and merge the cell state with the hidden state [5]. This reduces the complexity and computational cost while maintaining the capability to handle long-term dependencies:

$$\begin{aligned}z_t &= \sigma(W_{xz}x_t + W_{hz}h_{t-1} + b_z) \\ r_t &= \sigma(W_{xr}x_t + W_{hr}h_{t-1} + b_r) \\ \hat{h}_t &= \tanh(W_{xh}x_t + r_t \odot (W_{hh}h_{t-1}) + b_h) \\ h_t &= (1 - z_t) \odot h_{t-1} + z_t \odot \hat{h}_t\end{aligned}$$

3. Applications of RNNs

This section focuses on making RNN models more interpretable, which is critical for their adoption in high-stakes applications, by visualizing hidden states and learned features [4]. RNNs have been successfully applied to various domains:

3.1. Natural Language Processing (NLP)

We explore the application of RNNs in emerging fields such as bioinformatics and climate modeling, demonstrating their versatility beyond traditional domains like NLP and speech recognition [6]. In NLP, RNNs are used for tasks such as language modeling, machine translation, and sentiment analysis. They are capable of capturing the context and semantics of words in a sequence, making them ideal for text generation and sequence-to-sequence models.

3.2. Speech Recognition

Innovative training techniques to overcome RNN limitations are presented, including methods to address the vanishing gradient problem and the use of meta-learning. RNNs are employed in speech recognition systems to convert spoken language into text [3]. The temporal nature of speech signals aligns well with the sequential processing capabilities of RNNs, enabling them to model phonetic and linguistic structures effectively.

3.3. Time Series Prediction

RNNs are widely used in financial forecasting, weather prediction, and other time series analysis tasks [2]. Their ability to maintain and utilize historical information allows them to make accurate predictions based on past trends.

4. Advantages and Limitations

By understanding advantages and limitations, researchers and practitioners can better leverage RNNs in their applications, while also exploring alternative architectures and techniques to mitigate the challenges [5, 6].

4.1. Sequential Data Handling

RNNs are uniquely suited for tasks involving sequential data due to their ability to maintain a hidden state that captures information about previous time steps. This capability makes them ideal for applications where the order and context of the input data are crucial, such as language modeling, machine translation, and speech recognition. By leveraging the sequential nature of the data, RNNs can understand and generate sequences with contextual coherence, enabling sophisticated analyses and predictions.

4.2. Parameter Sharing

Another significant advantage of RNNs is parameter sharing across different time steps. Unlike feedforward neural networks, which require separate parameters for each layer, RNNs use the same set of weights for each time step in the sequence. This reduces the total number of parameters that need to be learned, leading to more efficient models that are less prone to overfitting. Parameter sharing also means that RNNs can generalize better across different parts of the input sequence, learning more robust patterns in the data.

4.3. Vanishing Gradient Problem

One of the most significant challenges with traditional RNNs is the vanishing gradient problem. During backpropagation through time (BPTT), gradients of the loss function with respect to earlier layers can become exceedingly small, effectively preventing the network from learning long-term dependencies. This issue is particularly pronounced in long sequences, where the influence of early inputs diminishes rapidly as the sequence progresses. The vanishing gradient problem limits the ability of RNNs to capture long-range dependencies, which is critical for many applications.

4.4. Computational Intensity

Training RNNs can be computationally intensive, especially for long sequences. The recurrent nature of these networks means that each time step's computation depends on the previous time step, making parallelization challenging. This sequential dependency results in longer training times compared to feedforward neural networks, particularly when dealing with large datasets or complex architectures like LSTMs and GRUs. Additionally, the increased complexity and number of parameters in advanced RNN architectures lead to higher computational costs and resource requirements.

5. Recent Advancements and Future Directions

We speculate on the future of RNNs, including potential breakthroughs such as quantum RNNs and their integration with neuromorphic computing, outlining a vision for future research [4]. Recent research has focused on improving the efficiency and performance of RNNs. Techniques such as attention mechanisms and transformers have significantly enhanced the capability of neural networks to handle long-term dependencies without relying solely on recurrence. Moreover, advancements in hardware and optimization algorithms continue to drive the scalability and applicability of RNNs.

Future research is expected to further explore hybrid models that combine the strengths of RNNs with other architectures, such as convolutional neural networks (CNNs) and transformers, to tackle increasingly complex tasks. Additionally, efforts to improve the interpretability and robustness of RNN models will be crucial for their deployment in critical real-world applications.

Conclusion

RNNs continue to be a vital technology for sequential data processing. By integrating modern techniques, exploring novel applications, and addressing traditional limitations, this paper highlights the ongoing evolution and future potential of RNNs in various domains. Recurrent Neural Networks have proven to be a powerful tool for sequential data processing, with applications spanning multiple domains. Despite their limitations, advancements in RNN architectures and training techniques have mitigated many of the challenges, paving the way for more robust and efficient models. As research continues to evolve, RNNs are expected to remain a cornerstone of neural network applications in the foreseeable future.

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Rezyume: *Rekurrent neyron tarmoqlar boshqa neyron tarmoqlari arxitekturalaridagi yutuqlarga qaramay, ketma-ketlikdagi ma'lumotlarni qayta ishlash uchun asosiy texnologiya bo'lib*

qolmoqda. Ushbu maqolada turli xil RNN arxitekturalarining batafsil qiyosiy tahlili taqdim etilgan bo'lib, bunda RNN asosidagi yangi ilovalar o'rganildi. Bundan tashqari, neyron to'rlarini o'qitishning ilg'or metodologiyalari talqin qilindi va ularni optimallashtirish muhokama qilingan.

Резюме: Рекуррентные нейронные сети остаются основополагающей технологией последовательной обработки данных, несмотря на достижения в других архитектурах нейронных сетей. В этой статье представлен подробный сравнительный анализ различных архитектур RNN, исследуются новые приложения и интегрируются передовые методы для устранения традиционных ограничений. Кроме того, обсуждаются передовые методологии обучения, интерпретируемость и оптимизация производительности, что открывает путь для будущих инноваций в этой области.

Kalit so'zlar: rekurrent neyron tarmoqlari, uzoq va qisqa muddatli xotira, ventillanadigan takroriy birlik, ketma-ketlikdagi ma'lumotlarni qayta ishlash, diqqat mexanizmlari, vaqt seriyalarini bashorat qilish, model interpretatsiyasi.

Ключевые слова: рекуррентные нейронные сети, длинная кратковременная память, вентилируемая рекуррентная единица, последовательная обработка данных, механизмы внимания, прогнозирование временных рядов, интерпретируемость модели.

RESEARCH ON THE CORROSIVE PROPERTY OF TWO-LAYER POLYMER COATINGS THAT PROTECT OIL AND GAS PIPELINES FROM SOIL CORROSION

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Summary: This paper performed gravimetric analysis of the protection levels of epoxy polyurethane tar and sulfochlorinated polyethylene-based double-layer anti-corrosion coatings as well as differential-thermogravimetric, and found that double-layer anti-corrosion polymer coatings have high resistance to aggressive environments.

Keywords: epoxy tar, sulfochlorinated-polyethylene, corrosion, polymer, polymer composite material, polyethylene, double-layer polymer coating.

Research on the effect of corrosion on soil corrosion protection epoxy tar and sulfochlorinated-polyethylene-based polymer coatings of oil and gas pipelines table-1 presents the results of gravimetric determination of the degree of protection of sulfochlorinated polyethylene and double anti-corrosion coating with epoxy polyurethane.

Table-1. results of gravimetric determination of the degree of protection of double-layer anti-corrosion coatings based on epoxy polyurethane tar and sulfochlorinated polyethylene

Test environment	Pointers	Control pattern	EUXP-1	EUXP-2	EUXP-3
H ₂ O	K	0,011	0,002958	0,00001	0,000028
	Z	-	98,6	97,9	96,3
NaCl (5%)	K	0,043	0,00066	0,00067	0,00058
	Z	-	95,3	96,7	94,7
Na ₂ CO ₃ (5%)	K	0,057	0,0062	0,00054	0,00075
	Z	-	93,7	93,9	92,8
CaCl ₂ (5%)	K	0,038	0,00059	0,00057	0,0006
	Z	-	96,1	97,2	96,5
Na ₂ S (5%)	K	0,05	0,0029	0,00073	0,00075
	Z	-	93,8	97,5	97,2
Na ₂ CO ₃ (5%)	K	0,044	0,00056	0,00058	0,00051
	Z	-	97,9	97,8	97,5
K ₂ SO ₄ (5%)	K	0,049	0,00065	0,00064	0,00061
	Z	-	94,1	94,8	98,9
K ₂ SO ₄ ·MgSO ₄ ·6H ₂ O (5%)	K	0,055	0,00067	0,00066	0,00060
	Z	-	96,8	97,8	97,9
MgSO ₄ ·KCl·H ₂ O (5%)	K	0,036	0,00065	0,00066	0,00058
	Z	-	93,7	94,8	94,9
CaCO ₃ (5%)	K	0,027	0,00029	0,00027	0,00033
	Z	-	97,9	98,1	97,1

*K, (g/sm²day) – corrosion rate; Z%, - protection rate.

According to GOST 9.506-87, gravimetric determination of the degree of protection of eupx-1, EUXP-2, EUXP-3 brand epoxypoliurethane tar and sulfochlorinated-polyethylene-based double-layer anti-corrosion polymer coatings at test environment 25⁰C to obtain results, curves were obtained in which the ability to protect the corrosion inhibitor can be determined. The

protective capacity was determined by keeping the steel samples in a different aggressive environment for 50 days.

Studies have shown that epoxy polyurethane tar and sulfochlorinated-polyethylene-based double-layer anti-corrosion polymer coatings have sufficiently high corrosion-resistant properties to protect concrete, metal and other materials from chemical aggressive influences.

Thus, epoxypoliurethane tar and sulfochlorinated-polyethylene-based double-layer anti-corrosion polymer coatings are superior in their resistance to aggressive environments.

Identified in the comparison process:

1. The two-layer polymer coating used has good corrosion protection because no rust and moisture were found in the pipeline between the coating and the metal layers.

2. The two-layer polymer coating has a high viscosity ability, so no cracks were found on the surface of the sample.

3. Figure 1 shows that the condition of the gas pipeline section covered with a double-layer polymer coating is different from the untreated section of the pipeline. The part of the gas pipeline covered with polymer coating has no oxidation pores on the metal surface, and it has a smooth surface compared to the untreated part of the pipeline.

Tests have shown that epoxy polyurethane tar and sulfochlorinated-polyethylene-based double-layer anti-corrosion polymer coatings have sufficiently high corrosion-resistant properties to protect gas pipelines from aggressive impacts.



Figure-1. Testing double-layer anti-corrosion polymer coatings based on epoxy polyurethane tar and sulfochlorinated polyethylene.

In addition, the thermal stability of polymer coatings that protect the proposed oil and gas pipelines from soil corrosion is of great importance, as a result of the analysis of substances that are released under the influence of temperature, the impact and effectiveness on the environment has been studied. An isolated composite coating sample based on epoxy polyurethane and chlorsulfonated polyethylene was found to have six endothermic effects at 103,51; 190,34; 241,12; 401,20; 565,20 and 975,33 °C, and five exothermic effects at 249,48; 287,00; 336,87; 915,12 and 953,41 °C. The total mass reduction in the temperature range 100-1000°C of the thermogravimetry curve was 81,0%. In the 100-440°C temperature range, it was found that up to 50% of the mass was lost (Figure-2).

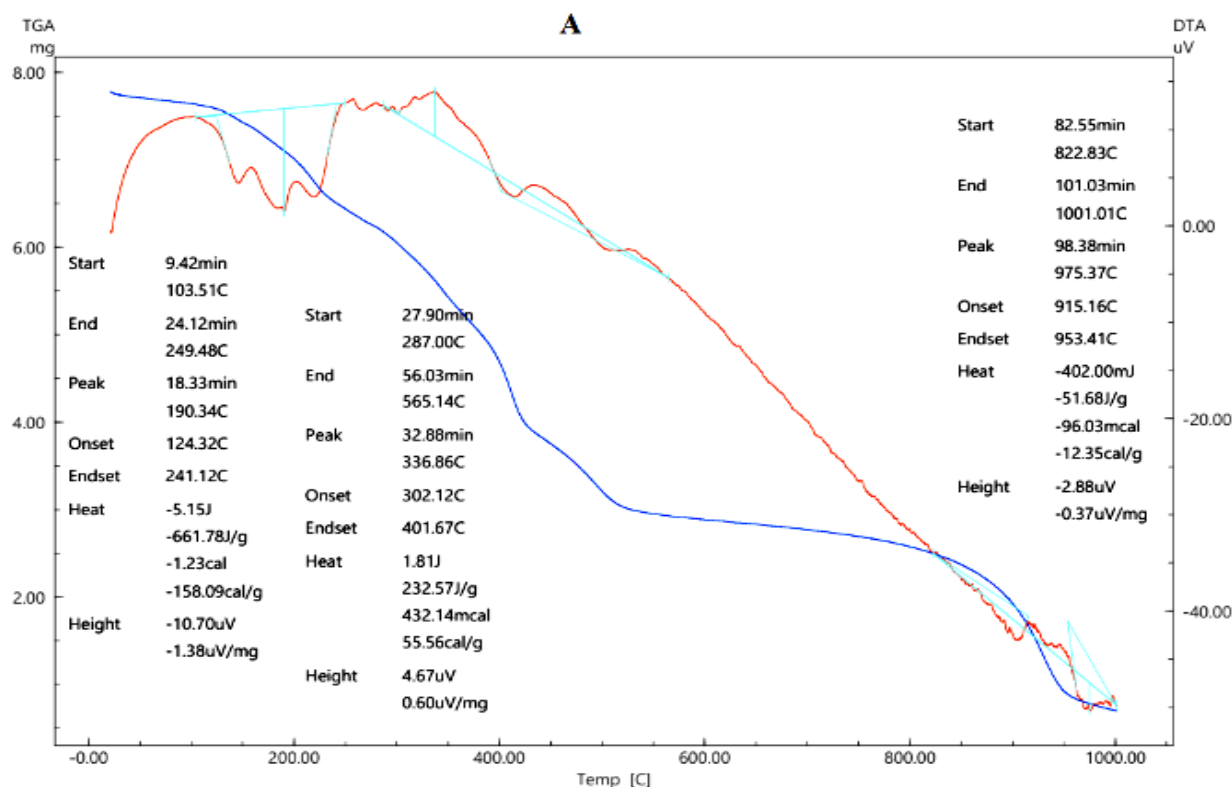


Figure-2. Differential-thermogravimetric analysis of an isolated composite coating sample based on epoxy polyurethane and chlorsulfonated polyethylene.

The main requirements for experimental tests of mass loss of isolated composite coating samples based on epoxy polyurethane and chlorsulfonated polyethylene include:

- the initial temperature of the sample is 22-30 °C;
- rate of temperature increase in differential-thermogravimetric analysis – 5,0; 10,0; and 20,0 °C/min;
- the thermal analysis temperature for polymer composite materials is 500-650 °C, for fireproof lok - paint products, as well as thermally stable materials - from 750 °C to - 850 °C is set according to the requirements of GOST 33403-2015.
- at the end of the destruction process, it is studied that 900-1000 °C is analyzed to temperature to form coke.

In figures-2, an analysis of the kinetics of mass loss with increasing temperature of epoxy polyurethane and chlorsulfonated polyethylene-based insulating composite coating samples was found to correlate mass loss in the 100-1000 °C temperature range to various processes.

The thermal stability of the above samples, depending on its composition, the nature of the polymer composite composition and the technology of obtaining the chemical composition, was determined through these experimental tests. Thus, the properties of thermoxidation destructions of corrosion-protective polymer coating samples were studied, relying on research data from the kinetics of processes in the temperature range from 100 to 1000 °C. The corrosion protection polymer composite has been found to have lost 50% mass at 428 °C.

The results showed that epoxy polyurethane Tar synthesized to protect gas and oil pipelines from soil corrosion and two layers of anti-corrosion polymer coatings based on sulfochlorinatedpolyethylene could be used extensively.

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Rezyume: maqolada epoksipoliuretan smolasi va sulfoxlorlangan polietilen asosidagi ikki qatlamli korroziyaga qarshi qoplamalarning himoya darajalari tahlil qilingan va ularning agressiv muhitga chidamliligi yuqoriligi aniqlangan.

Резюме: в статье проанализированы уровни защиты двухслойных антикоррозионных покрытий на основе эпоксиполиуретановой смолы и сульфохлорированного полиэтилена и определена их высокая стойкость к агрессивным средам.

Kalit so'zlar: epoksid smolasi, sulfoxlorlangan polietilen, korroziya, polimer, polimer kompozit material, polietilen, ikki qavatli polimer qoplama.

Ключевые слова: эпоксидная смола, сульфохлорированный полиэтилен, коррозия, полимер, полимерный композиционный материал, полиэтилен, двухслойное полимерное покрытие.

GENERATIVE AI TRANSFORMING CREATIVITY AND AUTOMATION

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Summary: This paper delves into the mechanisms, applications, and implications of Generative AI, examining its impact on various industries, potential ethical concerns, and future prospects. By leveraging advanced algorithms and vast datasets, Generative AI has revolutionized creative processes, automation, and problem-solving, paving the way for unprecedented innovations and challenges.

Keywords: generative ai, gans, vaes, transformer models, deep learning, creative automation, ethical ai

Introduction

The advent of Generative AI marks a significant milestone in the evolution of artificial intelligence. Unlike traditional AI, which primarily focuses on classification, prediction, and decision-making, Generative AI is designed to produce new, original content. This capability is achieved through sophisticated models such as Generative Adversarial Networks (GANs), Variational Autoencoders (VAEs), and transformer-based architectures like GPT (Generative Pre-trained Transformer). These models have been instrumental in a wide range of applications, from generating realistic images and deepfake videos to composing music and writing coherent articles.

1. Generative Adversarial Networks

GANs, introduced by Ian Goodfellow and his colleagues in 2014, consist of two neural networks: a generator (G) and a discriminator (D). The generator creates new data instances, while the discriminator evaluates them against real data. Through a process of adversarial training, the generator improves its output to the point where the discriminator can no longer distinguish between real and generated data.

The objective of GANs can be formulated as a minimax game:

$$\min_G \max_D V(D, G) = E_{x \sim p_{\text{data}}(x)} [\log D(x)] + E_{z \sim p_z(z)} [\log(1 - D(G(z)))]$$

where:

- ($D(x)$) is the probability that (x) is real.
- ($G(z)$) is the generated data from random noise (z).

2. Variational Autoencoders

VAEs, another popular generative model, are designed to learn a probabilistic mapping of input data to a latent space. By sampling from this latent space, VAEs can generate new data that resembles the input data. This probabilistic approach allows VAEs to produce diverse and coherent outputs.

The loss function for VAEs consists of two parts: the reconstruction loss and the KL divergence between the learned latent variable distribution and the prior distribution. The total loss ($\mathcal{L}$) is given by:

$$[\mathcal{L} = E_{q_\phi(z|x)} [\log p_\theta(x|z)] - D_{\text{KL}}(q_\phi(z|x) || p(z))]$$

where:

- ($q_\phi(z|x)$) is the approximate posterior.
- ($p_\theta(x|z)$) is the likelihood of the data given the latent variable.
- (D_{KL}) is the Kullback-Leibler divergence.

3. Transformer Models

Transformer models, particularly those based on the GPT architecture, have revolutionized natural language processing. These models leverage self-attention mechanisms to understand and generate human-like text. By pre-training on vast corpora of text and fine-tuning on specific tasks, transformer models can generate coherent and contextually relevant text, making them ideal for applications like chatbots, content creation, and code generation.

The attention mechanism in transformers is defined as:

$$[\text{Attention}(Q, K, V) = \text{softmax}\left(\frac{QK^T}{\sqrt{d_k}}\right)V]$$

where:

- (Q) is the query matrix.
- (K) is the key matrix.
- (V) is the value matrix.
- (d_k) is the dimension of the keys.

3. Applications of Generative AI

Generative AI has found extensive applications across various domains, revolutionizing numerous industries. In creative arts, it generates innovative artwork, music, and literature, enabling new forms of artistic expression. In healthcare, it aids in drug discovery, enhances medical imaging, and facilitates personalized medicine by generating patient-specific data. The gaming and entertainment industry benefits from AI-generated characters, environments, and narratives, creating immersive experiences. In finance and business, Generative AI models market scenarios, develops trading strategies, detects fraud, and automates content generation for marketing and customer service. These applications demonstrate Generative AI's potential to transform creativity, improve efficiency, and drive innovation across sectors.

3.1. Creative Arts

Generative AI has found extensive use in the creative arts, enabling artists, musicians, and writers to push the boundaries of their craft. AI-generated artwork, such as those created by GANs, has been featured in galleries and auctions. Music composition algorithms can generate new melodies and harmonies, assisting composers in exploring novel musical landscapes. In literature, AI can co-author stories, providing writers with inspiration and new narrative possibilities.

3.2. Healthcare

In healthcare, Generative AI is used for drug discovery, medical imaging, and personalized medicine. By generating new molecular structures, AI can assist in the development of novel drugs. In medical imaging, AI can enhance the resolution of scans and generate synthetic data to train models, improving diagnostic accuracy. Personalized treatment plans can be developed by generating patient-specific data and simulating various treatment outcomes.

3.3. Gaming and Entertainment

The gaming industry has embraced Generative AI for creating realistic characters, environments, and storylines. Procedural content generation algorithms can create vast, immersive game worlds, enhancing player experiences. In the film industry, AI is used for special effects, character animations, and even scriptwriting, streamlining production processes and enabling new creative possibilities.

3.4. Finance and Business

In finance, Generative AI is applied to model market scenarios, generate trading strategies, and detect fraudulent activities. Business applications include automated content generation for

marketing, customer service chatbots, and personalized recommendations. By automating these tasks, businesses can improve efficiency and customer engagement.

4. Ethical Considerations

Ethical considerations in Generative AI are paramount, addressing issues like deepfakes, misinformation, and intellectual property rights. The technology's ability to create realistic but fake content poses significant risks for political manipulation, defamation, and spreading false information. Moreover, questions about the ownership and rights of AI-generated content challenge existing intellectual property laws. Additionally, biases present in training datasets can be perpetuated, leading to unfair and discriminatory outcomes in generated content. Ensuring ethical use involves implementing robust frameworks, enhancing transparency, and fostering diversity in data to mitigate these risks and promote responsible AI development and deployment.

4.1. Deepfakes and Misinformation

One of the most significant ethical concerns associated with Generative AI is the potential for misuse in creating deepfakes and spreading misinformation. Deepfake technology can produce highly realistic but fake videos and images, which can be used for malicious purposes, such as political manipulation or defamation.

4.2. Intellectual Property

The use of Generative AI in creating content raises questions about intellectual property rights. Who owns the rights to AI-generated content? Can AI be considered a co-creator? These questions necessitate a reevaluation of current intellectual property laws to address the unique challenges posed by AI.

4.3. Bias and Fairness

Generative AI models are trained on vast datasets that may contain biases. These biases can be inadvertently perpetuated in the generated content, leading to issues of fairness and discrimination. Ensuring that AI systems are trained on diverse and representative data is crucial to mitigate these risks.

4.4. Advancements in Model Architectures

Ongoing research in model architectures promises to further enhance the capabilities of Generative AI. Innovations in GANs, VAEs, and transformers will likely lead to more efficient, robust, and versatile models capable of generating even more sophisticated content.

4.5. Interdisciplinary Integration

The integration of Generative AI with other emerging technologies, such as augmented reality (AR), virtual reality (VR), and the Internet of Things (IoT), will open new avenues for innovation. For instance, AI-generated content can be seamlessly integrated into AR and VR environments, creating immersive experiences in education, entertainment, and training.

4.6. Ethical AI Development

As Generative AI continues to evolve, the emphasis on ethical AI development will become increasingly important. Establishing frameworks for responsible AI usage, enhancing transparency, and implementing robust safeguards against misuse will be essential to harness the full potential of Generative AI while mitigating its risks.

Conclusion

Generative AI represents a transformative technology with the potential to revolutionize various industries by automating creative processes and generating new content. From the arts and

healthcare to gaming and finance, its applications are vast and varied. However, the ethical implications of Generative AI cannot be overlooked, necessitating careful consideration and proactive measures to ensure responsible usage. As research progresses and new innovations emerge, Generative AI will continue to shape the future of creativity and automation, offering unprecedented opportunities and challenges.

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Rezyume: *Ushbu maqolada generativ sun'iy intellekt tizimlari, ularning qo'llanilishi chuqur ko'rib chiqilgan va uning turli sohalarga ta'siri, potentsial etik muammolar va kelajak istiqbollarini tahlil qilingan. Ilg'or algoritmlar va katta hajmdagi ma'lumotlar to'plamidan foydalangan holda Generative AI ijodkorlik, avtomatlashtirish va muammolarni hal qilishda inqilobiy texnologiya bo'lib mazkur maqolada uning imkoniyatlari tahlil qilingan.*

Резюме: *В этой статье подробно рассматриваются механизмы, приложения и последствия генеративного искусственного интеллекта, рассматривается его влияние на различные отрасли, потенциальные этические проблемы и перспективы на будущее. Используя передовые алгоритмы и обширные наборы данных, Generative AI произвел революцию в творческих процессах, автоматизации и решении проблем, открыв путь для беспрецедентных инноваций и задач.*

Kalit so'zlar: *generativ sun'iy intellekt, gans, vaes, transformer modellar, chuqur o'qitish, ijodiy avtomatlashtirish, etik sun'iy intellekt.*

Ключевые слова: *генеративный искусственный интеллект, gans, vaes, модели-трансформеры, глубокое обучение, творческая автоматизация, этический искусственный интеллект*

OBTAINING DEPRESSANT COMPOSITIONS WITH SYNERGISTIC EFFECT AND THEIR MECHANISM OF ACTION

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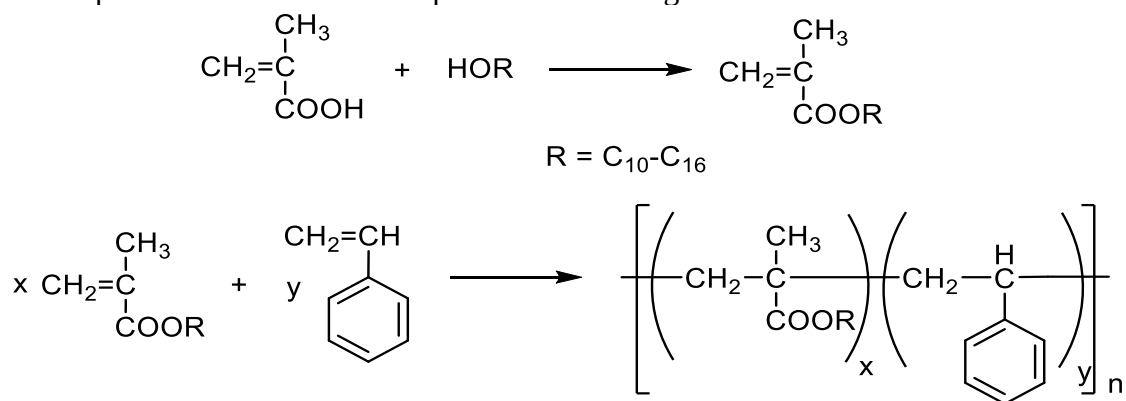
Summary: The article examines the synthesis of hetero-copolymers based on alkyl methacrylates and sterol and the effect of external environment on them. Also, the kinetics of the copolymers and their influence on the depressor, i.e., sedimentation stability of gasoline and diesel fuels were studied. The copolymers synthesized on the basis of the obtained alkyl methacrylates were structurally analyzed by modern physicochemical methods. Mechanisms of depressor and dispersant action of copolymers were analyzed and conclusions were drawn.

Keywords: winter diesel fuel, lubricants, hydrotreated diesel fuel, limiting filtration temperature, pour point depressant, dodecyl methacrylate, higher fatty alcohols, styrene, spectroscopy.

Introduction: Rational use of fuel and lubricants, improvement of their quality and expansion of resources are the main tasks of modern oil refining and petrochemical synthesis industry. Currently, an important solution to this problem is to strengthen the requirements for the quality indicators of commodity oil products. In the modern economy, one of the urgent problems is to constantly increase production efficiency along with improving product quality and environmental safety [1]. Also, in order to improve the physico-chemical and sedimentation properties of fuel and diesel fuel, it is important to synthesize polymers and copolymers and obtain compositions based on them using the raw materials available in our republic [2].

Materials and methods

The reaction was carried out in a three-necked flask equipped with a stirrer and a thermometer. 14,4 g of methacrylate acid and 27,4 g of C₈-C₁₀ synthetic fatty alcohol were added to the flask in a 1:1 ratio. The mixture was added dropwise with 2,5 mL of 80 % sulfuric acid while slowly heating. The reaction mixture in the flask was heated and stirred at 80 °C for 3 h at atmospheric pressure. Then the reaction mixture was cooled to 20-25 °C at room temperature. After the reaction was completed, a concentrated solution of sodium carbonate was used to neutralize the unreacted acrylic acid. During the neutralization process, a concentrated solution of sodium carbonate was added to the ether portion of the mixture, stirring the liquid slowly with a glass rod until the blue litmus paper dipped into the ether turned red. As a result of the release of carbon dioxide gas in the mixture, foam was formed in the mixture. The resulting complex ether was separated from the lower aqueous layer using a Buchner funnel and filtered through porous filter paper. After filtering, complex ester of acrylic acid containing 37,202 g was formed, the yield of the reaction was calculated. The molar ratio of monomers to copolymerization yield and molecular mass, and temperature were studied and presented in the figures below.



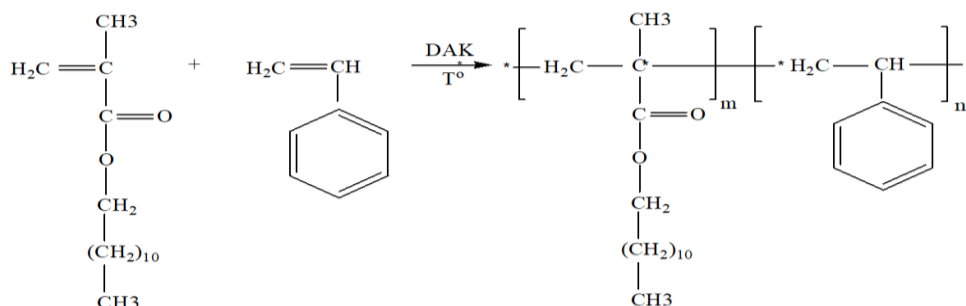


Figure 1. Copolymer formation reaction

The influence of the amount of styrene and the initiator on the kinetics of the copolymer was studied when the ratio of dodecyl methacrylate and styrene monomers was 9:1 when the temperature was 60-85 °C.

Table 1
Description of copolymerization in solution with dodecyl methacrylate and styrene (solvent p-xylene, initiator AINB=5.10-3 mol/l, T=80 °C, reaction duration 120 minutes)

Composition of the initial mixture, % mol		The amount of ether group, 10 ² %	Copolymer content, % mol		By molecular mass, M _n ether number
M ₁	M ₂		m ₁	m ₂	
10	90	0,6688	5,00	95,00	838,82
20	80	0,6469	11,00	89,00	867,21
30	70	0,6155	19,00	81,00	911,45
40	60	0,5673	30,00	70,00	988,89
50	50	0,5331	37,00	63,00	1052,33
60	40	0,4787	47,00	53,00	1171,92
70	30	0,4097	58,00	42,00	1369,29
80	20	0,3287	69,00	31,00	1706,72
90	10	0,2027	83,00	7,00	2767,63

Table 2
Dependence of the composition of the initial mixture of dodecyl methacrylate and styrene on the copolymer composition (solvent n-xylene, initiator AINB 5.10-3 mol/l, T=80 °C, reaction duration 180 minutes)

Composition of the initial mixture, % mol		The amount of ether group, 10 ² %	Copolymer content, % mol		By molecular mass, M _n ether number
M ₁	M ₂		m ₁	m ₂	
10	90	0,6250	3,00	97,00	897,60
20	80	0,5987	7,00	93,00	937,03
30	70	0,5748	13,00	87,00	975,99
40	60	0,5410	21,00	79,00	1036,95
50	50	0,5000	30,00	70,00	1108,69
60	40	0,4500	40,00	56,00	1246,66
70	30	0,3888	51,00	49,00	1442,90
80	20	0,3202	62,00	38,00	1752,03
90	10	0,2195	76,00	24,00	2555,81

In this case, both constants of copolymerization are equal to $r_1 < 1$, $r_2 > 1$, in which the rate of reaction increases with the increase of methyl acrylate concentration, the macroradical ending with the methyl acrylate link, the yield of copolymers carried out up to 180 minutes increases from the

initial 51,8 to 78,4%, temperature and increasing from 54,3 to 86,3% with increasing amount of initiator was found during research.

Table 3

Effect of temperature and initiator on DDMA and ST copolymerization reaction (reaction duration 120-180 minutes)

Copolymerization conditions			Classification of copolymers		
Temperature °C	ST amount %	(AINB) amount of initiator %	Copolymer yield % (60 min)	Copolymer yield % (120 min)	Copolymer yield % (180 min)
60	50	0,3	51,8	65,2	78,4
65		0,4	52,4	68,1	79,8
70		0,5	53,7	70,4	81,2
75		0,6	56,1	73,8	83,7
80		0,7	54,3	74,5	86,3

The effect of temperature and initiator on copolymer yield and molecular mass shows that changing the reaction time from 75 °C to 80 °C in 60 minutes led to a decrease in copolymer molar mass.

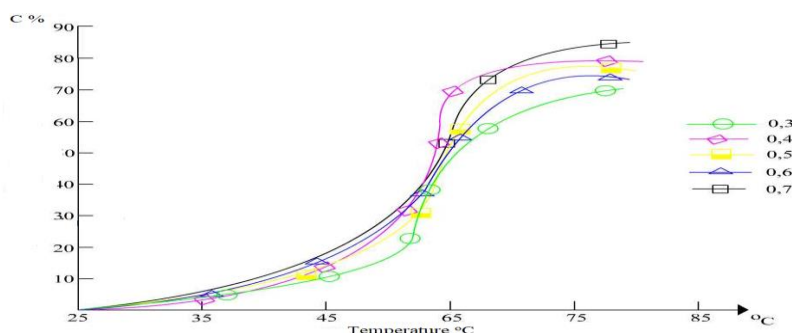


Figure 2. Effect of changing temperature and initiator consumption on DD and ST copolymerization reaction (ST 50%, reaction duration 180 minutes)

It was explained that DDMA is more active than macroradical. Radical graft copolymerization of ST with DDMA in a ratio of 9:1, 1:1 at a temperature of 333-353 K, the initiator is dinitrile of diazoisomoic acid (DAK) (0,3-0,7%), the amount of polypropylene in the copolymer is 50% and the solvent p-xylene the effect on the copolymer yield in the environment was studied in the unit of time and the obtained results in 120-180 minutes are presented in the following tables.

In the course of our research, the effect of increasing the amount of polypropylene in the initial mixture of monomers in the copolymer to 80%, the temperature 60-80 °C, the amount of the initiator in the range of 0,3-0,7 %, and the effect on the yield and molecular weight of the copolymer were studied.

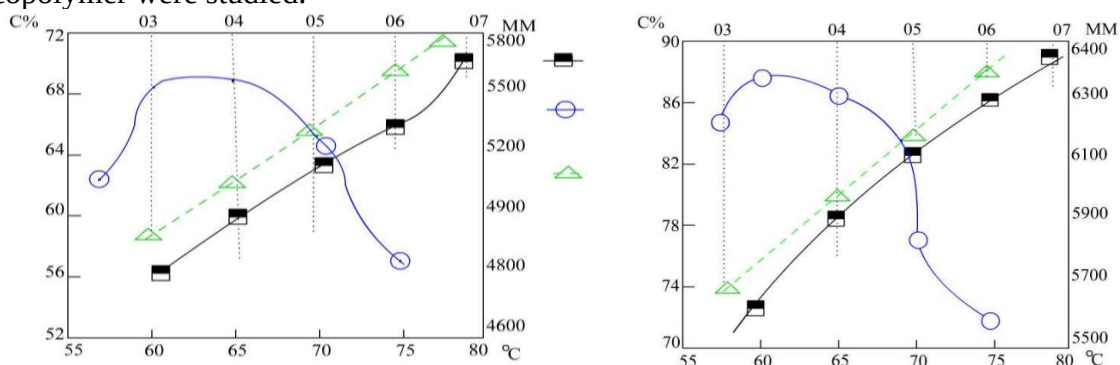


Figure 3. Effect of temperature and initiator on copolymer yield and molecular mass (DDMA 80%, reaction duration 120 - 180 minutes)

We can see that the molecular weight of the copolymer increases from 4827,12 to 6404,29 g/mol when the copolymerization reaction is carried out from 60 minutes to 180 minutes when the ratio of polypropylene and methyl acrylate is 4:1 in the initial mixture of monomers in the copolymer. The effect of temperature and initiator on copolymer yield and molecular mass showed that (reaction duration 60-180 minutes) temperature change from 60 °C to 80 °C increased the yield of copolymer, at the same time temperature from 70 °C and initiator 0,5 The increase of % resulted in a significant decrease in the results of the molecular mass. In this case, there is a possibility of formation of a complex between Lsuis bases type solvents during copolymerization with DDMA and ST. When the process is carried out with the presence of an initiator (DAK), the mutual copolymerization constants of DDMA and ST change, as well as the values of r_1 and r_2 in the copolymerization of polypropylene with methacrylate are explained by the increase in the p-acid of the benzene hydrocarbon series.

Results

Synthesized copolymers were analyzed by IR IRAffinity-1S FOURIER TRANSFORM INFRARED SPECTRO-PHOTOMETER (SHIMADZU) and NMR spectroscopic methods, and the results are presented in the following figures.

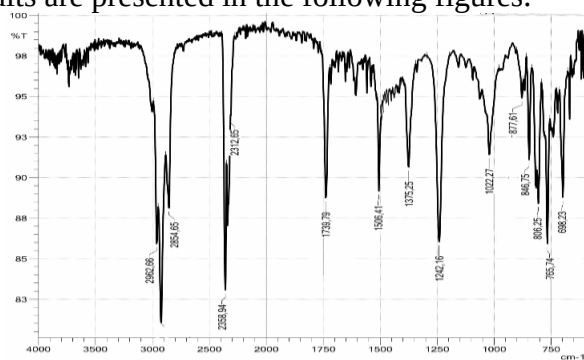


Figure 4. IR spectrum of DDMA and ST copolymer (9:1).

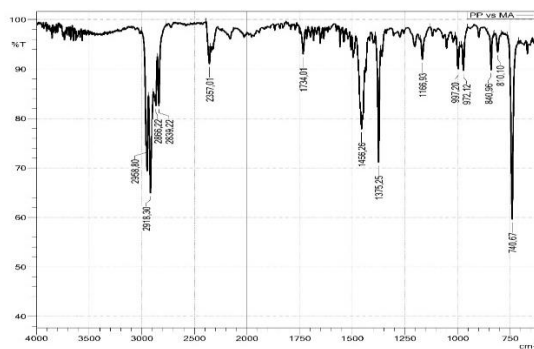


Figure 5. IR spectrum of DDMA and ST (1:1) copolymer

Absorption peaks of copolymers based on alkyl methacrylate and styrene with a monomer ratio of 9:1 and 1:1 can be seen in the following spectra. In the spectra, the absorption region of 698,23-765,74 cm^{-1} is due to vibrations of the sp^3 hybridized alkyl group CH_2 , 877,91-1022,27 cm^{-1} of the benzene ring, 1242,26 cm^{-1} is the valence vibration frequency of the complex ether group, which has a very strong intensity. 1739,79 cm^{-1} of carbonyl group and 3000,00 cm^{-1} of sp^3 hybridized $\text{CH}_3\text{-C-}$ belong to valence vibrations [3].

The main properties of NMR spectra: chemical shift, spin-spin constant, interactions, integral, signal intensity. Below, the NMR spectra of methacrylate and met acrylic acid copolymers with polypropylene were studied and presented.

As can be seen in the spectrum, in both spectra, the triplet signal of the proton atom in the -CH_3 0,91 ppm area of the polypropylene main chain in the copolymer, and the doublet-doublet signal of the proton atom in the $\text{-CH}_2\text{-}$ 1,31 ppm area, $(\text{-CH}_2\text{-})_x$ 0,92 ppm, CH 1,60 ppm proton atom singlet signal, -CH_3 3,03 ppm attached to the methacrylate group attached to polypropylene azo chain -CH_3 3,03 ppm, -CH_2 attached to OCO group, 6,12 ppm -CH- 1,83 ppm signal was observed in the fields.

The effect of copolymers on paraffin hydrocarbons was studied using SEM in the temperature range from -5 to -25 °C. The loss of fluid mobility is usually associated with the crystallization of paraffins, forming crystals consisting of large-sized concretions of microcrystals (Fig. 8 a). As a result of paraffin crystallization, fuel and diesel fuel separate into layers and deposits form on the walls of the pipes (Fig. 8 b), fuel filters are clogged, and as a result, the filter pumps fail [4]. Microscopic images of diesel fuel with 4000 ppm PP and MA in the temperature range from -5 °C to -25 °C are presented in the following pictures. Mechanisms of action of depressants are related to their paraffin hydrocarbon effect.

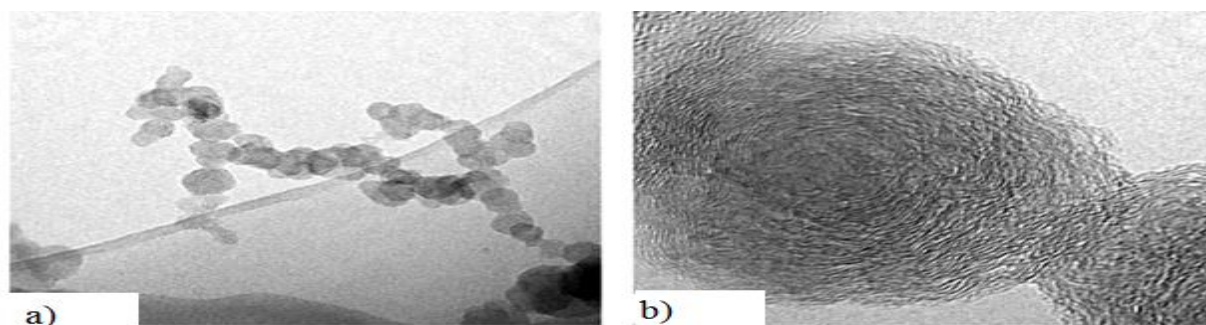


Figure 8. DDMA and ST + DF display in 9:1 ratio at -5 °C

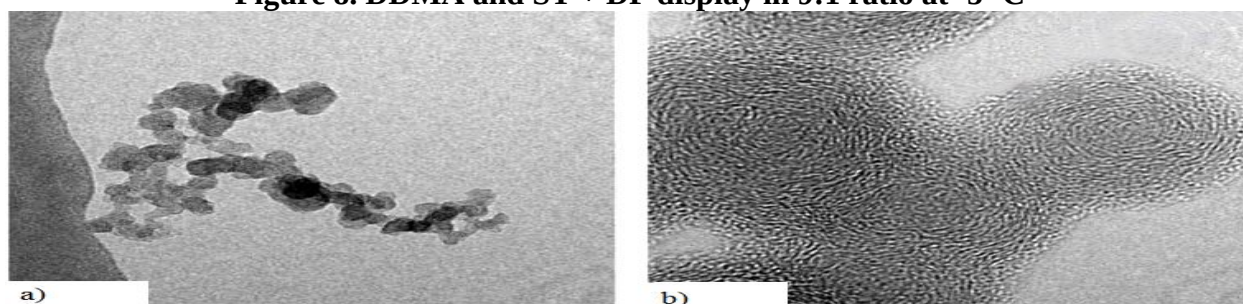


Figure 9. DDMA and ST + DF display in 9:1 ratio at -15

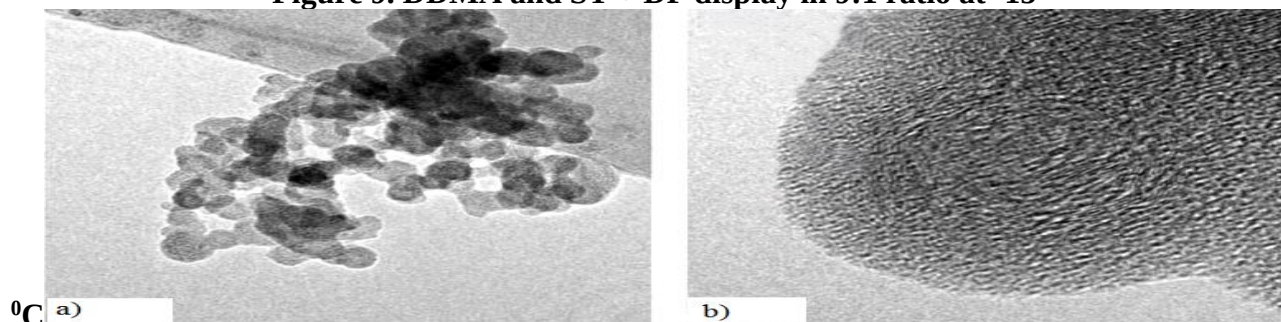


Figure 10. View of PP and MA + DF in 4:1 ratio at -25 °C

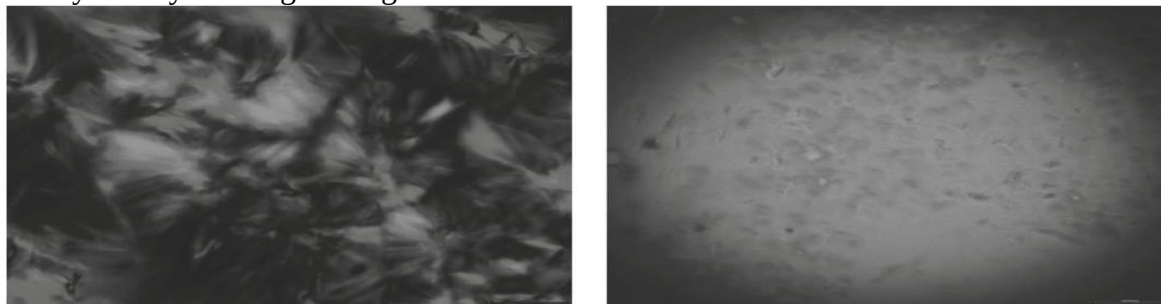
A characteristic structural feature of macromolecules of depressor additives (modifiers of paraffin crystals) is long linear saturated hydrocarbon chains and polar functional groups or branched hydrocarbon compounds.

Results presented in part a) of the above picture (50 nm), and part b) (5 nm) are detailed microscopic views. As can be seen from the picture, it shows that diesel fuel particles consist of spherical primary particles. As a result of electrostatic interaction, they collide with each other and combine to form chain-like and branched agglomerate structures. The structure of primary particles in diesel fuel with a -5 °C charge is less likely to merge with each other, showing a clear and regular chain-like structure. In -15 °C diesel fuel, the primary particles are stacked on top of each other in centers that do not have precision and have a more solid chain-like structure. In Fig. 10, the chain-like particle structures of diesel fuel with a temperature of -25 °C are connected with each other. The paraffin molecules are close to each other and connected to each other, and the primary particle becomes a crystal agglomerate structure, and the stable weak paraffin crystals are formed in the center of the core, and the long-chain alkyl group among them acts as an inhibitor of crystal growth. and the effective interaction between n-alkanes changed the crystallization habit of the crystals, and polar monomers (containing DDMA long chain and oxygen atoms) were attached to the surface of the crystals, preventing the crystal cross-linking does.

Discussion

It can be concluded that the copolymer particles belong to the category of long-chain saturated hydrocarbons containing sp^3 hybridized CH_2 group, oxygen polar functional compounds and compounds containing CH_3 methyl group. As a result of the research analysis, i.e. when diesel

fuel with and without additives is observed under a microscope, it can be concluded that the sp^3 hybridized CH_2 radical group in the copolymer is more similar to the n-paraffins in the diesel fuel, and it can be concluded that coordination is observed on the surface of the paraffin hydrocarbon nuclei. The reason is that n-paraffins are not allowed to grow together in cold conditions. The function of the functional groups contained in the copolymer primer is to prevent the growth of paraffin crystals by creating a charge.



a) without additives DF

b) with additives DF

Figure 11. BX41-P OLYPUS Polarizing Microscope Appearance of Paraffin Crystals in Unplugged and Plugged Diesel Fuel.

Therefore, in cold conditions, n-paraffin crystals in diesel fuel start at a lower temperature. As a result, the stable form of paraffin crystals is small crystals.

The depressor pad plays an important role in preventing and lowering the filtration threshold temperature by reducing crystal viscosity.

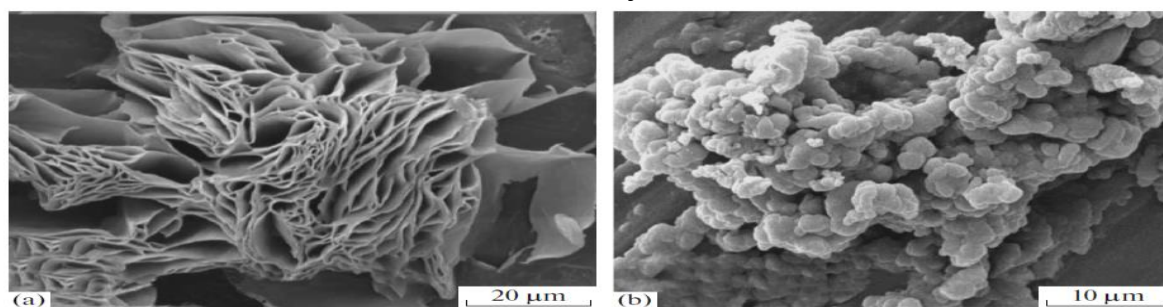


Figure 12. Appearance of diesel fuel crystals without (a) and with (b) a plug using Chem D software.

Thus, in the absence of depressor additives in hydrotreated diesel fuel, n-paraffin hydrocarbons crystallize with the formation of plate-shaped agglomerate crystals. Addition of a depressor plug to diesel fuel under cold conditions results in dispersion of n-paraffin hydrocarbons (Figure 12). At the same time, the saturated long alkyl chain hydrocarbons in the copolymer can adsorb paraffin hydrocarbons, block the extensive growth of paraffin matrixes, and reduce the possibility of forming three-dimensional spatial networks by stopping the coalescence forces between the crystals.

Table 4

Effect of DDMA and styrene-based additives on low-temperature properties of diesel fuel

The name of the sample	Additives, mac. %	Blurring temperature, °C	Freezing temperature, °C	Poir point temperature, °C
Winter diesel fuel norm	O`z DSt 1134:2018	- 5	- 25	- 15
Diesel fuel without additives	-	- 4	- 14	- 5
Diesel fuel + No. 1 plug (1:1)	0,1	- 5	- 21	- 17
	0,3	- 5	- 25	- 23

Diesel fuel + Prisadka No. 2 (4:1)	0,1	- 5	- 27	- 18
	0,3	- 5	- 28	- 19

Table 5

Effect of DDMA and styrene-based additives on residual oil deposition temperature

The name of the sample	Additives, mac. %	Viscosity + cCt at 100 °C	Solidification temperature, °C
Residual oil	-	17,43	-15
Residual oil + No. 1 additives (1:1)	0,3	17,65	-17
	0,5	18,76	-18
Residual oil + No. 1 additives (4:1)	0,3	17,47	-19
	0,5	18,29	-23

Thus, when studying the effect of DDMA and ST-based additives on the low-temperature properties of diesel fuel and the solidification temperature of residual oils, 0,3 % of the copolymer improved the solidification temperature of diesel fuel by -11 °C and residual oil by -8 .

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Rezyume: Maqolada alkil metakrilatlar va sterol asosidagi getero-sopolimerlarning sintezi va ularga tashqi muhitning ta'siri o'rganiladi. Shuningdek, sopolimerlarning kinetikasi va ularning depressorga ta'siri, ya'ni benzin va dizel yoqilg'ilarining cho'kma barqarorligi o'rganildi. Olingan alkil metakrilatlar asosida sintez qilingan sopolimerlar zamonaviy fizik-kimyoviy usullarda strukturaviy tahlil qilindi. Sopolimerlarning depressor va dispersant ta'sir qilish mexanizmlari tahlil qilindi va xulosalar chiqarildi.

Резюме: В статье рассмотрены синтез гетеросополимеров на основе алкилметакрилатов и стерины и влияние на них внешней среды. Также изучена кинетика сополимеров и их влияние на депрессорную, т.е. седиментационную устойчивость бензинов и дизельных топлив. Проведен структурный анализ сополимеров, синтезированных на основе полученных алкилметакрилатов, современными физико-химическими методами. Проанализированы механизмы депрессорного и диспергирующего действия сополимеров и сделаны выводы.

Kalit so'zlar: qishki dizel yoqilg'isi, moylash materiallari, gidrotozalangan dizel yoqilg'isi, filtrlash haroratini cheklash, quyish nuqtasini depressant, dodesil metakrilat, yuqori yog'li spirtlar, stirol, spektroskopiya.

Ключевые слова: зимнее дизельное топливо, смазочные материалы, гидроочищенное дизельное топливо, предельная температура фильтрации, депрессорная присадка, додецилметакрилат, высшие жирные спирты, стирол, спектроскопия.

UDC 631.632:14

TWO-STAGE ACID PROCESSING OF KARAKALPAKSTAN NODULAR PHOSPHORITE FLOUR INTO GRANULATED SIMPLE SUPERPHOSPHATE

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Summary: *The option of producing granular simple superphosphate in anhydrite mode under conditions of a minimum amount of water is considered, where at the 1st stage the main part of the phosphate raw material (70-80%) is decomposed by 93% H_2SO_4 with the formation of concentrated H_3PO_4 (45-50% P_2O_5) and anhydrite $CaSO_4$, and at the 2nd stage the resulting acidic mass is neutralized by the remaining part of the phosphate raw material (20-30%), resulting in the process of neutralization of concentrated H_3PO_4 with the formation of $Ca(H_2PO_4)_2$. During the granulation process, the addition of 12% H_2O ensures a granule strength of at least 2 MPa. The material balance of the process for obtaining 1 ton of granulated simple superphosphate has been calculated.*

Key words: *nodular phosphate flour, sulfuric acid, double-stage treatment, simple superphosphate, granulation, composition, granule strength, material balance.*

Introduction. In 2019, enterprises of the Republic produced 143.0 thousand tons of phosphate fertilizers (based on 100% nutrients). And the need for agriculture in the republic in 2020 was 759.3 thousand tons of P_2O_5 . This means that industry satisfies the need for phosphate fertilizers only by 15.8%.

The Kyzylkum phosphorite complex annually produces 716 thousand tons per year of washed calcined concentrate with an average content of 26% P_2O_5 (MOK-26). From it, Ammofos-Maxam JSC receives ammophos and Suprephos-NS, enriched superphosphate and partially feed ammonium phosphate. At the same time, Indorama Kokand Fertilizers JSC and Elektrokimyozavod JV JSC produce simple superphosphate from MOK-26 and phosphate rock (17-18% P_2O_5 , 44-45% CaO and 15-17% CO_2), respectively. The volume of simple superphosphate in physical terms does not exceed 150 thousand tons per year. There is a shortage of phosphate raw materials, and high-quality ones at that.

Simple superphosphate is one of the cheapest and most accessible phosphate fertilizers [1]. It consists of monocalcium phosphate and gypsum. Due to the presence of gypsum, it is a good soil structure-former and a chemical ameliorant for salt marshes [2]. Simple superphosphate is a single phosphorus fertilizer that is effective for application under autumn fall plowing. According to the recommendations of agrochemists and soil scientists, 60-70% of the annual phosphorus norm should be applied to cotton under fall plowing, 100% to cereal grains, and 75% to vegetable crops [3]. This is why it is so important to increase the production of single phosphate fertilizers.

In conditions of a shortage of high-quality phosphate raw materials, it is necessary to begin the development of local agronomic ores, which have not yet been developed on an industrial scale. An example of this is the nodular phosphorites of Karakalpakstan, where there are dozens of their deposits. These fields are: Khujakul, Sultan-Uizdag, Khojeyli, Porlytau, Nazarkhan, Chukay-Tukay, etc. [4].

They can be developed for agricultural needs and will quickly solve the problems of providing phosphorus fertilizers for local use. If we start processing phosphorites in Karakalpakstan, we will be able to satisfy the region's need for phosphorus-containing fertilizers for many years.

Simple superphosphate is produced by sulfuric acid decomposition of natural phosphates using chamber, flow or chamber-flow methods [1].

The disadvantages of chamber technology for the production of simple superphosphate are as follows:

a) six-day ripening in a warehouse and three-time shoveling, passivation of the active centers of all consumable fluorocarbonate apatite and incomplete extraction of H_3PO_4 into the liquid phase;

b) diffusion inhibition of the formation reaction of $Ca(H_2PO_4)_2$ and a high content of free H_3PO_4 in the chamber product;

c) unsatisfactory granulation of superphosphate mass and high return;

d) unorganized release of harmful substances and high dust content of production premises, since warehouse ripening is a powerful source of emission of fluoride compounds into the atmosphere.

The option of excluding chamber ripening and warehouse ripening, as well as ammoniation and drying from the scheme, is shown in the example of the production of simple superphosphate from phosphorites of the Central Kyzylkum of various grades and is considered in works [5-7], where it is proposed to process phosphorite in two stages:

1) The main part of the phosphate raw material (70-80%) is decomposed by concentrated sulfuric acid (93% H_2SO_4) to form concentrated H_3PO_4 containing at least 45-50% P_2O_5 and crystallization of $CaSO_4$ in the form of anhydrite;

2) The acidic reaction mass containing concentrated H_3PO_4 and anhydrite is treated with the remaining part of the phosphate raw material (20-30%), resulting in the process of neutralization of phosphoric acid with the formation of $Ca(H_2PO_4)_2$.

Referring to the positive results of this method, in this work we studied the process of decomposition of nodular phosphorites of Karakalpakstan in two stages with the production of granular simple superphosphate.

At the 1st stage, the duration of decomposition is 15-20 minutes, the temperature is 120-130 °C. The 2nd stage is carried out by neutralization of H_3PO_4 and granulation of the product by pelletizing and both stages are combined in one apparatus. Total duration – 25-30 minutes. Due to the exothermic nature of the reaction, the stage of drying the product is eliminated.

Methods and materials. Samples of nodular phosphamide from Khodjakul and Porlytau were taken as raw materials, the compositions and properties of which are given in tab. 1-3.

Table 1

Physico-mechanical characteristics of phosphorites of Karakalpakstan

Properties of phosphate raw materials	Indicators	
	Khodjakul	Porlytau
Initial humidity, %	0,66	0,50
Density, gr/sm ³	1,640	1,42
Angle of repose, degree.	40°52′	38°54′
Hygroscopic point, %	44,3	45,4
Moisture capacity, %	6,7	5,9
pH 10% suspension	9,23	9,18

Table 2

Class of sizes of phosphorites of Karakalpakstan

Phosphate raw materials	Mass part of fraction (mm), weight. %								
	-5+3	-3+2	-2+1	- 1+0,5	- 0,5+0,1	- 0,1+0,16	- 0,16+0,1	- 0,1+0,05	- 0,05
Khodjakul	7,65	24,4 3	18,29	3,00	22,73	10,07	4,11	6,20	3,51
Porlytau	8,78	23,6 5	16,30	1,82	18,02	12,63	6,57	7,64	4,59

Table 3

The main chemical composition of Karakalpakstan phosphorites

Phosphate raw materials	Contents of components, wt %									
	P ₂ O ₅	CaO	Fe ₂ O ₃	Al ₂ O ₃	MgO	CO ₂	F	SO ₃	SiO ₂	Insoluble residue
Khodjakul	19,11	32,83	3,50	1,54	0,30	4,03	1,58	1,10	28,0	2,62
Porlytau	15,76	27,20	2,66	1,03	1,57	4,10	1,90	1,30	38,77	0,74

In tab. 1 shows data on the physical and mechanical characteristics of phosphorites in Karakalpakstan. From the given data it is clear that at the initial humidity (0.50-0.66%), the free bulk density for Khodjakul is 0.99 g/cm³ and Porlytau - 0.88 g/cm³, and with compaction it is 1.64 and 1.42 g/cm³, respectively. If the angle of repose is smaller, then the bulk substances will have greater mobility. The angle of repose is 40 degrees for the 1st sample and 38 degrees for the 2nd sample. Their flow ability is uniform and disperses without any difficulty. The hygroscopic point turned out to be 44.3% for the 1st sample and 45.4% for the 2nd sample. The maximum moisture capacity is in the range of 5.9-6.7%; at high levels of humidity they lose their friability. Therefore, when storing and transporting raw materials, it is necessary to protect them from moisture.

In tab. 2 shows data on the dispersed composition of various types of phosphate raw materials used for laboratory research.

And in the tab. 3 shows their chemical composition of phosphorites of Karakalpakstan. Phosphorite from the Khodjakul deposit has the largest amount of phosphorus (19.11% P₂O₅), the least from the Porlytau deposit (15.76% P₂O₅). The phosphate mineral of Khodjakul phosphorite is represented by francolite (Ca₁₀P_{5.2}C_{0.8}O_{23.2}P_{4.8}F_{1.8}OH) and kurskite (Ca₁₀P_{4.8}C_{1.2}O_{22.8}P_{4.8}F₂(OH)_{1.2}) in almost equal quantities (27.09 and 25.7%), and Porlytausky only with kurskite (45.6%).

Thus, the composition and properties of nodular phosphorites are quite suitable as phosphate raw materials for the production of activated simple superphosphate intended for local use.

The methods given in [8, 9] were used to determine the angle of repose, density and fluidity of phosphate samples. The hygroscopic properties of the feedstock were determined by the desiccator method at 25°C [8]. The fractional composition of phosflour was determined according to GOST 21560.1-82. The mass fraction of fractions is determined by sieving samples on sieves mechanically. To determine the fractional composition, samples weighing 200 g were taken.

Chemical analysis of the starting materials, reaction mass and finished fertilizers was carried out according to the methods given in [10]. The concentration of the H₂SO₄ solution was established using a 0.1 N NaOH solution with an accuracy of ±0.1%.

To determine the amount of free P₂O₅ in the test samples, a solution containing free H₃PO₄ was titrated with sodium hydroxide solution. Phenolphthalein and methyl orange were used as indicators. Calcium content by complexometric method. The total, digestible and water-soluble form of phosphorus was determined by the differential method [10]. The digestible forms of phosphorus and calcium were determined using a 2% solution of citric acid.

The strength of the granules of the finished product (grain size 2-3 mm) was determined using the IPG-1 installation using the NIUIF method [11].

The decomposition of phosmuca samples was carried out in a thermostated reactor. To maintain the anhydrite regime, the temperature in the reactor was maintained at 130°C. The rate of 93% sulfuric acid was taken as 100% of the stoichiometry for the formation of phosphoric acid (1st stage). And the rate of phosphorus itself to neutralize the phosphoric acid gypsum mass is taken to be 150 to 200% for the formation of Ca(H₂PO₄)₂ (2nd stage).

Results and discussion. At the initial stage, the kinetics of decomposition of phosphate raw materials was studied. The duration of interaction of phosmuca with sulfuric acid is taken: 2; 5; 10; 20; 40 and 60 min. (Table 4).

Table 4

The influence of the time of sulfuric acid treatment of phosphate rock on the degree of its decomposition (The rate of sulfuric acid is 100% for the formation of H_3PO_4)

Norm H ₂ SO ₄ from stoichio- metry, %	Reaction time, minutes	P ₂ O ₅ content in the reaction mass, wt. %			P ₂ O ₅ wat. : P ₂ O ₅ tot. %
		P ₂ O ₅ tot.	P ₂ O ₅ wat.	Free acidity	
Khodjakul					
100	2	10,72	10,07	18,13	93,94
	5	10,81	10,25	18,12	94,82
	10	11,00	10,57	18,10	96,09
	20	11,39	11,11	18,07	97,54
	40	11,68	11,43	18,00	97,86
	60	11,97	11,73	17,94	97,99
Porlytau					
100	2	10,04	9,24	13,63	92,03
	5	10,12	9,43	13,68	93,18
	10	10,27	9,70	13,74	94,49
	20	10,54	10,22	13,91	96,96
	40	10,63	10,35	13,97	97,36
	60	10,72	10,47	14,05	97,67

* Free acidity as the sum of free phosphoric and sulfuric acids

From the data obtained it is clear that with an increase in decomposition time from 2 to 60 minutes, the decomposition coefficient ($K_{diff.}$) increases, that is, the relative content of P₂O₅wat. from 93.94 to 97.99% for Khodjakul phosphate flour and from 92.03 to 97.67% for Porlytau phosphate flour. At the same time, the content of P₂O₅tot. increases from 10.72 to 11.97% and from 10.04 to 10.72%, respectively.

Based on $K_{diff.}$, a sufficient decomposition time for phosphate raw materials can be taken as 20 minutes, at which P₂O₅wat. : P₂O₅tot. = 97.54 and 96.96%, respectively, for phosphate flour Khodjakul and Porlytau. Increasing the time to 40 minutes and above does not lead to a significant change in $K_{diff.}$. If the decomposition time is less than 20 minutes, the production of a thixotropic mass, which is necessary for further processing, is not ensured.

The influence of the H_2SO_4 rate on the process of decomposition of phosphate flour materials was studied during a 20-minute interaction of the components. The results are summarized in tab. 5.

Table 5

The influence of the rate of sulfuric acid on the degree of its decomposition of phosphate flour (treatment duration - 20 minutes)

Norm H ₂ SO ₄ from stoichiometry, %	Reaction temperature, °C	P ₂ O ₅ content in the reaction mass, wt. %			P ₂ O ₅ wat.: P ₂ O ₅ tot. %
		P ₂ O ₅ tot.	P ₂ O ₅ wat.	Free acidity	
Khodjakul					
70	114	13,15	10,90	5,41	82,89
80	118	12,55	11,20	8,72	89,24
90	125	11,95	11,36	12,09	95,06
100	130	11,39	11,11	18,07	97,54
110	132	10,95	10,89	22,67	99,45

Porlytau					
70	111	11,17	9,17	3,99	82,09
80	113	10,95	9,54	6,81	87,12
90	116	10,72	9,95	10,06	92,82
100	118	10,54	10,22	13,92	96,96
110	121	10,27	10,09	19,93	98,25

* Free acidity as the sum of free sulfuric and phosphoric acids

It has been shown that with an increase in the H_2SO_4 rate from 70 to 110%, the temperature of the reaction mass increases from 114 to 132°C. If higher the acid rate, will be higher the acidity of the reaction mass. So, if at a norm of H_2SO_4 - 70% the content of P_2O_5 free. in the reaction mass is 5.41%, then at rates of 100% it increases to 18.07% and at 110% - to 22.67%. For Porlytau phosphate flour this figure is 3.99; 13.92 and 19.93%, respectively. At 100% acid rate $P_2O_{5\text{wat.}}$: $P_2O_{5\text{tot.}}$ is 97.54% for Khodjakul and 96.96% for Porlytau. A further increase in the acid rate can lead to an increase in excess $H_2SO_{4\text{free}}$ and deterioration of the physical properties of the intermediate product.

To obtain the finished superphosphate, the acidic reaction mass of the phosphate flour itself was neutralized (2nd stage of processing). When the acidic mass is neutralized, the granulation process of fertilizers occurs, where calcium sulfate crystals saturated with phosphoric acid act as the granulation center. The norm of the Khodjakul phosphate varied from 100 to 250% of the stoichiometry for the formation of $Ca(H_2PO_4)_2 \cdot H_2O$, and for the Porlytau phosphate from 150 to 200%. In this case, the total rate of sulfuric acid (total for both stages for the formation of monocalcium phosphate) ranges from 70.17 to 92.84% and from 74.43 to 90.95%.

The neutralization temperature was maintained constantly at 90-95°C, and the duration of mixing the mass was 20 minutes. Granulation of the product was carried out by rolling and intensive mixing. The composition of granular products is given in tab. 6.

Table 6

Products after neutralizing the free acidity of the reaction mass with phosphate flour
(processing time - 20 minutes)

Phosflour norm for the formation of $Ca(H_2PO_4)_2$, %	$P_2O_{5\text{tot.}}$, %	$P_2O_{5\text{free.}}$, %	$CaO_{\text{tot.}}$	$P_2O_{5\text{assim.}}$: $P_2O_{5\text{tot.}}$ %	$P_2O_{5\text{wat.}}$: $P_2O_{5\text{tot.}}$ %	$CaO_{\text{assim.}}$: $CaO_{\text{tot.}}$, %	Strength of granules, MPa
Khodjakul							
100	12,16	7,95	20,89	99,83	88,65	65,15	1,04
150	12,58	6,96	21,61	95,15	83,78	62,61	1,27
200	12,89	5,26	22,14	96,51	77,81	64,32	1,38
225	13,05	4,24	22,42	97,08	74,79	65,12	1,43
250	13,21	3,27	22,69	97,73	71,76	65,93	1,49
Porlytau							
100	11,10	5,99	indef.	95,55	87,03	indef.	0,98
150	11,47	3,56	- // -	97,03	78,81	- // -	1,16
200	11,89	2,55	- // -	93,86	67,11	- // -	1,42

It has been shown that the higher the rate of phosphate flour, the lower the content of $P_2O_{5\text{free}}$ and the more $P_2O_{5\text{tot.}}$ in superphosphate. So, if at 100% phosflour norm the content of P_2O_5

is free. and $P_2O_{5tot.}$ in the product are 7.95 and 12.16%. At a norm of 200%, these indicators are 5.26 and 12.89%, and at a norm of 250% – 3.27 and 13.21%. But at the same time $P_2O_{5assim.} : P_2O_{5tot.}$ and $P_2O_{5wat.} : P_2O_{5tot.}$ decrease from 99.83 to 97.73%, from 88.65 to 71.76%, respectively. And the strength of the granules increases from 1.04 to 1.49 MPa.

For Porlytau phosphate flour, the same pattern is observed, but with relatively low rates.

To obtain dry superphosphate granules, these neutralization products were dried at 100°C for 24 hours. Their composition is summarized in tab. 7.

Table 7

Composition of dried products depending on the rate of phosphate flour

Phosflour norm for the formation of $Ca(H_2PO_4)_2$, %	$P_2O_{5tot.}$, %	$P_2O_{5free.}$, %	$CaO_{tot.}$	$P_2O_{5assim.} : P_2O_{5tot.}$, %	$P_2O_{5wat.} : P_2O_{5tot.}$, %	$CaO_{assim.} : CaO_{tot.}$, %	Strength of granules, MPa
Khodjakul							
100	13,46	4,42	23,12	93,83	74,29	64,45	1,30
150	14,02	3,11	24,08	92,23	64,05	61,29	1,44
200	14,46	1,64	24,84	90,11	56,29	58,25	1,61
225	14,71	1,42	25,27	88,65	51,59	56,71	1,67
250	15,07	1,25	25,89	87,92	46,91	55,08	1,76
Porlytau							
100	11,56	2,77	indef.	96,97	76,64	indef.	1,15
150	11,86	1,92	- // -	95,53	67,79	- // -	1,34
200	12,20	0,90	- // -	93,03	57,87	- // -	1,50

According to the regulations, in the finished superphosphate the mass fraction of free P_2O_5 should not exceed 3.5%. Based on this, we have proposed the optimal rate of phosphate flour for neutralizing the product of sulfuric acid treatment - 200% (total rate of H_2SO_4 - 74-76%). In this case, the composition of the dry product is (wt.%): from Khodjakul phosphate $P_2O_{5 free.}$ – 1.64%, $P_2O_{5tot.}$ – 14.46%, $P_2O_{5assim.} : P_2O_{5tot.}$ = 90.11% and $P_2O_{5wat.} : P_2O_{5tot.}$ = 56.29%, $CaO_{assim.} : CaO_{tot.}$ = 58.25%, granule strength – 1.61 MPa; from Porlytau phosphate $P_2O_{5free.}$ – 0.90%, $P_2O_{5tot.}$ – 12.20%, $P_2O_{5assim.} : P_2O_{5tot.}$ = 93.03% and $P_2O_{5wat.} : P_2O_{5tot.}$ = 57.87%, granule strength – 1.50 MPa.

However, a sufficient commercial fraction of the product (1-5 mm) has not been achieved - less than 50% (should be at least 80%). The strength of the granules must be at least 2 MPa.

In order to improve granule formation and increase the strength of granules, the process of rolling the neutralized product was carried out in the presence of a certain amount of water. In this case, the amount of water varied from 10 to 15% H_2O relative to 100 g of product. In this case, sufficient solid round-shaped granules of various sizes have already formed. Then these granules were dried first at 60°C for 24 hours, and then at 105°C until constant weight.

The results of the analysis of samples of superphosphate granules for Khodjakul and Porlytau phosphate flour are given in table. 8 and 9, respectively.

Table 8

Composition and strength of dried simple superphosphate granules depending on the rate of Khodjakul phosphate flour and the amount of water

Phosflour norm for the formation of $Ca(H_2PO_4)_2$, %	$P_2O_{5tot.}$, %	$P_2O_{5free.}$, %	$P_2O_{5assim.} : P_2O_{5tot.}$, %	$P_2O_{5wat.} : P_2O_{5tot.}$, %	Strength of granules, MPa

with the addition of 10% water					
150	13,91	5,89	94,82	60,89	2,27
200	14,39	3,33	94,02	58,72	2,41
with the addition of 12% water					
150	13,62	5,30	89,57	60,87	3,25
200	14,08	2,49	80,54	56,67	3,58
with the addition of 15% water					
150	13,33	3,06	84,25	60,84	7,60
200	13,77	1,65	63,76	41,39	8,95

Table 9

Composition and strength of dried simple superphosphate granules depending on the rate of Porlytau phosphate rock and the amount of water

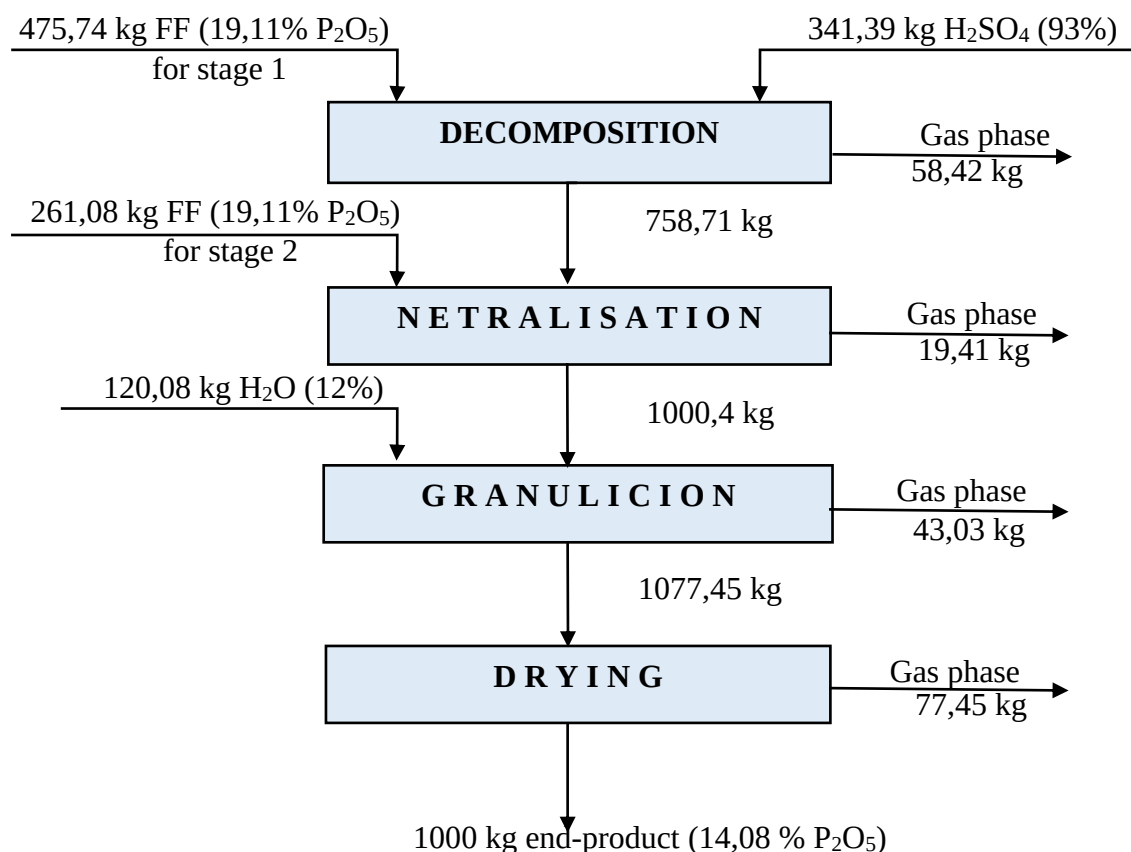
Phosflour norm for the formation of $\text{Ca}(\text{H}_2\text{PO}_4)_2$, %	$\text{P}_2\text{O}_{5\text{tot.}}$, %	$\text{P}_2\text{O}_{5\text{free.}}$, %	$\text{P}_2\text{O}_{5\text{assim.}} : \text{P}_2\text{O}_{5\text{tot.}}$, %	$\text{P}_2\text{O}_{5\text{wat.}} : \text{P}_2\text{O}_{5\text{tot.}}$, %	Strength of granules, MPa
with the addition of 10% water					
150	12,18	2,78	92,53	66,01	2,08
200	12,44	1,16	89,07	63,67	2,41
with the addition of 12% water					
150	12,11	2,32	86,95	59,54	3,26
200	12,52	1,02	83,47	56,55	3,85
with the addition of 15% water					
150	12,48	2,27	85,82	59,29	5,87
200	12,74	0,94	82,57	56,36	6,14

From the tab. 8 it can be seen that the higher the Khodjakul phosflour norm and humidity, the lower the P_2O_5 free content and the higher the strength of the product granules. In all cases, it is possible to obtain product granules with a strength greater than >2 MPa.

It has been shown that with the addition of 10% H_2O with a change in the Khodjakul phosphorus rate from 150 to 200%, the content of P_2O_5 free in granular superphosphate varies from 5.89 to 3.33%, $\text{P}_2\text{O}_{5\text{tot.}}$ from 13.91 to 14.39%, $\text{P}_2\text{O}_{5\text{assim.}} : \text{P}_2\text{O}_{5\text{tot.}}$ from 94.82 to 94.02%, $\text{P}_2\text{O}_{5\text{wat.}} : \text{P}_2\text{O}_{5\text{tot.}}$ from 60.89 to 58.72 and granule strength from 2.27 to 2.41 MPa. And with the addition of 15% H_2O , the composition of the product changes: P_2O_5 free from 3.06 to 1.65%, $\text{P}_2\text{O}_{5\text{tot.}}$ from 13.33 to 13.77%, $\text{P}_2\text{O}_{5\text{assim.}} : \text{P}_2\text{O}_{5\text{tot.}}$ from 84.25 to 63.76%, $\text{P}_2\text{O}_{5\text{wat.}} : \text{P}_2\text{O}_{5\text{tot.}}$ from 60.84 to 41.39 and granule strength from 7.60 to 8.95 MPa. This shows that the relative contents of digestible and water-soluble forms of phosphorus sharply decrease, which is explained by the hydrolysis of monocalcium phosphate into citrate-soluble di- and tricalcium phosphates.

Based on this, the optimal amount of water addition is 12% and 200% phosflour norm for the formation of $\text{Ca}(\text{H}_2\text{PO}_4)_2$. This produces superphosphate with the composition (wt.%): $\text{P}_2\text{O}_{5\text{free}} - 2.49\%$, $\text{P}_2\text{O}_{5\text{tot.}} - 14.08\%$, $\text{P}_2\text{O}_{5\text{assim.}} : \text{P}_2\text{O}_{5\text{tot.}} = 80.54\%$, $\text{P}_2\text{O}_{5\text{wat.}} : \text{P}_2\text{O}_{5\text{tot.}} = 56.67\%$ with a granule strength of 3.58 MPa and $\text{pH} = 3.1$. Under these conditions, the following product (wt.%) was obtained from Porlytau phosphate: $\text{P}_2\text{O}_{5\text{free.}} - 1.02\%$, $\text{P}_2\text{O}_{5\text{tot.}} - 12.52\%$, $\text{P}_2\text{O}_{5\text{assim.}} : \text{P}_2\text{O}_{5\text{tot.}} = 83.47\%$, $\text{P}_2\text{O}_{5\text{wat.}} : \text{P}_2\text{O}_{5\text{tot.}} = 56.55\%$ with a granule strength of 3.85 MPa and $\text{pH} = 3.0$.

The figure shows the material balance of the process of producing granular superphosphate from Khodjakul phosphate (FF) according to the anhydrite scheme.



Picture. Material balance and diagram of material flows of a two-stage process for obtaining granular superphosphate from Khodjakul phosflour

Thus, the resulting products belong to one-way phosphorus fertilizers, where there is no deficient ammonia. They are effectively used for plow application in all types of soils.

Conclusion. Two-stage acid treatment of phosphorites from Karakalpakstan has been studied. In the first stage, the main part of phosphate decomposes - 70-80% of the mass of phosphate flour taken with 93.0% concentration of H_2SO_4 . The rate of sulfuric acid is 90-110% for the formation of phosphoric acid, the content in the pre-calculation in P_2O_5 is 45.0-50.0%, where calcium sulfate crystallizes in the form of anhydride CaSO_4 ; in the second, the mass obtained from the first stage containing H_3PO_4 (45-50% P_2O_5) and CaSO_4 is treated with the remaining phosphorite (20-30%), due to which crystallization of $\text{Ca}(\text{H}_2\text{PO}_4)_2 \cdot \text{H}_2\text{O}$ occurs. For the 1st stage, the optimal rate of H_2SO_4 is 100%, and for the 2nd stage, the optimal rate of phosphate is 200%. In this case, the composition of the dry product is (wt.%): from Khodjakul phosphate flour $\text{P}_2\text{O}_{5\text{free}}$ – 1.64%, $\text{P}_2\text{O}_{5\text{tot}}$ – 14.46%, $\text{P}_2\text{O}_{5\text{assim.}} : \text{P}_2\text{O}_{5\text{tot.}} = 90.11\%$ and $\text{P}_2\text{O}_{5\text{wat.}} : \text{P}_2\text{O}_{5\text{tot.}} = 56.29\%$, granule strength – 1.61 MPa. To improve granulation and strength of the granules, they were rolled in the presence of 10-15% water. A material balance of production has been developed.

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Rezyume: Angidrid rejimida suvni minimal sarflash orqali donadorlangan oddiy superfosfat olish usuli ko'rib chiqilgan, bunda 1-bosqichda fosfat xomashyosining asosiy qismi (70-80%) 93 % li sulfat kislotasi bilan kontsentrlangan fosfor kislotasi (45-50 % P_2O_5) va kaltsiy sulfati angidridi $CaSO_4$ hosil bo'lgunga qadar parchalanadi, 2-bosqichda hosil bo'lgan kislotali massa fosfat kislotasining qolgan qismi (20-30 %) bilan neytrallanishi natijasida kontsentrlangan H_3PO_4 neytrallanib, $Ca(H_2PO_4)_2$ hosil bo'ladi. Donadorlash jarayonida 12 % miqdorda H_2O qo'shilishi donalar mustahkamligining 2 MPa dan kam bo'lmasligini ta'minlaydi. 1 tonna donadorlangan oddiy superfosfat olish jarayonining moddiy balansi hisoblangan.

Резюме: Рассмотрен вариант получения гранулированного простого суперфосфата в ангидритном режиме в условиях минимального количества воды, где на 1-ой стадии основная часть фосфатного сырья (70-80%) разлагается 93 %-ной H_2SO_4 с образованием концентрированной H_3PO_4 (45-50% P_2O_5) и ангидритного $CaSO_4$, а на 2-ом образовавшейся кислая масса нейтрализуется оставшейся частью фосфатного сырья (20-30%), в результате чего происходит процесс нейтрализации концентрированной H_3PO_4 с образованием $Ca(H_2PO_4)_2$. В процессе грануляции добавка 12 % H_2O обеспечивает прочность гранул не менее 2 МПа. Расчитан материальный баланс процесса получения 1 тонна гранулированного простого суперфосфата.

Kalit so'zlar: jelvakli fosforit uni, sulfat kislotasi, ikki bosqichli qayta ishlash, oddiy superfosfat, donadorlash, tarkib, donalar mustahkamligi, moddiy balans.

Ключевые слова: желваковая фосфоритовая мука, серная кислота, двухступенчатая обработка, простой суперфосфат, грануляция, состав, прочность гранул, материальный баланс.

UDC 678

RESEARCH OF PHYSICO-CHEMICAL PHENOMENA IN HETEROCOMPOSITE HYBRID STRUCTURES BASED ON LOCAL WASTE

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Summary: *The article deals with the extraction of technical carbon from the oil residue rich in macromolecules obtained as a result of the secondary processing of petroleum products and their mechanical, physical and chemical activation, and their use as a filler in epoxy resin-based materials. In addition, technical carbon added to the composition of hybrid materials based on reactoplast has been found to act as an antioxidant in preventing material destruction.*

Keywords: *Solar energy, hybrid composite polymer materials (GCPM), heterocomposite, adhesive strength, microhardness, impact viscosity, dispersion, filler, destruction.*

Introduction.

Today, in the field of modern materials science, the role of scientific research in the discovery of new types of materials is of great importance in the development of any country. It is known that dielectric materials are the main representatives of polymeric materials [1]. It is important to slow down or completely stop the degradation of reactive polymer materials during their operation, and this task can be performed by carbon dispersing fillers as antioxidants [2].

Technical carbon production is the process of treating liquid or gaseous highly aromatic hydrocarbon raw materials at temperatures above 1200 °C through low pressure and short-term heat treatment. There are several industrial methods of technical carbon production, depending on the raw material and its decomposition method. All of them are based on the thermal (pyrolysis) or thermal-oxidative decomposition of liquid or gaseous hydrocarbons. Of these, the most widely used method for extracting technical carbon from oil waste is extraction in furnaces [1].

The mechanical activation of filler particles plays an important role in the formation of structures in hybrid composite materials, the improvement of the physical, mechanical, and operational properties of the material, and the formation of strong bonds between structures. The composition of natural minerals mainly consists of ion-bonded oxides, and the forces acting on the formation of positively and negatively charged particles in the process of mechanical activation and the trajectory of movement are the main factors that determine the properties of the material.

Today, the use of energy-saving methods in the production of hybrid structured polymer composite materials is one of the most urgent problems. In particular, the use of solar energy in the process of drying polymer composite materials is one of the developing areas [2–6].

It is known that direct exposure to natural sunlight improves the properties of composites. The improvement of the physical and mechanical properties is explained by the heating of the polymer mass and the substrate during the direct processing of the polymer coating in sunlight, that is, during the chemical reaction of the cross-linking with the hardening agent [7]. Reducing the viscosity of the composition increases the mobility of the macromolecular chains of the polymer and improves the orientation of the functional groups of the interacting components.

The environment of renewable energy sources is solar radiation, large-scale resources, environmental cleanliness, and the greatest prospect. The main factor shaping the climate is a significant flow of solar radiation, which reaches 800-1000 MJ/m² per month in summer [8]. Solar energy is carried mainly through light and, to a lesser extent, infrared rays. When light interacts with matter, some of the incident light is absorbed by the matter, and it heats up. When heated, the degree of freedom of the elements of the polymer macromolecule increases, and the polymer moves to a highly elastic state. Polymers stick together when heated. In addition, the physical and

mechanical properties of heterocomposite materials (GKPM) improve with direct exposure to the sun [9, 10]. This is due to the direct processing of the polymer-based coating in the sun; that is, during the chemical cross-linking reaction, the substrate is heated with the polymer mass and the hardening agent. Reducing the viscosity of the composition leads to an increase in the mobility of the macromolecular chains of the polymer and improves the orientation of the functional groups of the interacting components.

During the processing and use of polymers, they are often exposed to heat and air. Therefore, the elimination of thermal oxidation is of great importance. Today, it is difficult to use heterocomposite materials on the surface of the working bodies of machines with certain methods of modification, such as ultrasound, radiation, electromagnetic influence, etc. In this regard, studies were conducted on the effects of heterocomposite materials and coatings. Currently, oil technical carbon powder fillers from the secondary processing of oil products obtained from the Fergana oil refinery are widely used in various economic sectors of our Republic [11–13].

Technical carbon contains sulfur, oxygen, and nitrogen atoms and is subject to oxidation with a highly developed surface area of 5–150 m²/g. The actual density of technical carbon particles is 1.76–1.9 g/cm³ [14].

Stabilizing the structure and increasing the destruction and aging resistance of polymers are achieved through various technological methods that have their own characteristics. A relatively common method of preventing destruction by light and radiation is the introduction of chemical reagents (compounds) that can absorb ultraviolet and other rays without photosynthesis or self-transformation. Such reagents include fillers, stabilizers, etc. [15]. Currently, obtaining components for new materials using the waste of local production enterprises and using them for production facilities is considered one of the urgent issues.

Methods. The "GN oil sludge treatment system" technology was used to separate the dispersed technical carbon used as a filler in the production of hybrid polymer composite material from the industrial waste produced at the Fergana oil refinery. The technical carbon extraction system from oil sludge with the help of this technology is based on washing oil sludge with chemicals at a temperature of 60–700 °C.m. This system has a production capacity of 2 m³/s and is designed for small-scale production and laboratory analysis.

A vibroplanetary activator with simultaneous reciprocating and rotating motion was used for the mechanical activation of fillers in hybrid structural polymer composite materials [6]. The vibroplanetary activator is a generalized and modernized type of vibratory and planetary crusher available today for the activation of filler particles. It differs from others in that it generates the Coriolis force during activation. The rotation frequency of the vibroplanetary activator electric motor is 750–3000 rev/min. It is possible to adjust [16].

Using the XRD-6100 X-ray diffractometer, the functional group fluctuations in different areas were analyzed, and the influence of structural aspects on destruction was studied. XRD-6100 X-ray diffractometers are designed for conducting X-ray analysis of materials, determining their crystallinity levels, determining residual stresses in the structure of materials, and conducting many material analyses [17].



Figure 2. XRD-6100 X-ray diffractometer.

Results and discussion. First of all, in order to improve the mechanical properties of the polymer composite material with the hybrid composite material with a reactoplast binder, Angren

kaolins, which are used as fillers, were vibro-vibrated with a mixture of AKF (78–15%), AKS (30–6%), AKT (10–4%), and technical carbon obtained from oil waste (5%). In our planetary mechanism, it begins with obtaining nanopowders by the mechanochemical activation method.

The duration of the activation time is 30 minutes, the size of the particles becomes homogenized, the main part (70–75%) has a dispersion of 2–2.5 μm , and the rest (10–15%) has a size of 10–50 nm. (10–15%) has a size of 2.5–3 μm . consists of particles (Fig. 3). Activation of particle surfaces during activation is important in structure formation processes. So, the optimal value of the activation time is equal to 30 minutes, and according to the structural analysis of the activated components, we can emphasize that the proposed method, that is, the activation period of the activated particles using the vibro-planetary mechanism, ensures the process of creating a structure that ensures the operational properties of the materials.

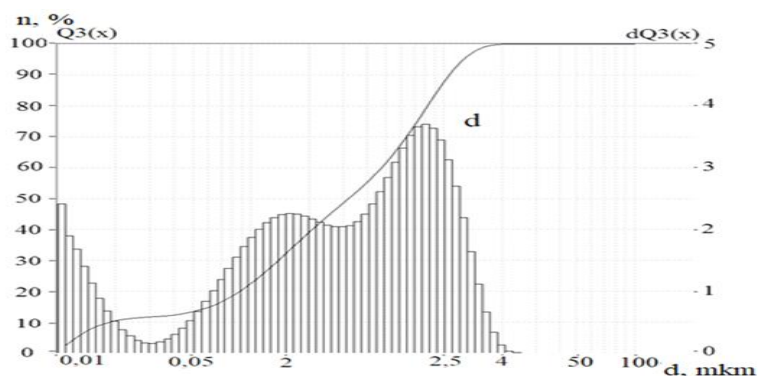


Figure 3. Dispersion of mechanically activated fillers for 30 minutes.

As a result of the X-ray diffractometer XRD-6100 study of polymer composite materials based on hardened epoxide resins, fluctuations of functional groups in different areas were analyzed, and their effect on destruction from the structural point of view was studied. Accelerator dibutyl phthalate (DBF) with epoxy resins based on ED-20, hardener PEPA, fillers, 3 types of kaolin brands (AKT-10, AKS-30, and AKT-78), screening silk waste (IQICH), and polymer composites to increase its mechanical strength against destruction. The composition of composite materials was created on the basis of technical carbon oil waste and analyzed by direct exposure to natural sunlight. In this case, it can be observed that in the presence of epoxy resin PEPA, the branching reaction in the structure proceeds quickly, and the rest of the substances are considered accelerators of reaction processes and fillers; therefore, a partial reaction may occur in the composites made with fillers, but the polymer composites we offer are made of waste materials; technical carbon oil waste is added. In composites with high physical and mechanical properties, technical carbon is dispersed in the epoxy resin composition, increasing its specific strength and significantly reducing destruction. These results are shown by the analysis of the obtained diffractometric studies. On the basis of the obtained results, it is explained by the groups characteristic of epoxide resins and the bonds formed by other additives (Fig. 4).

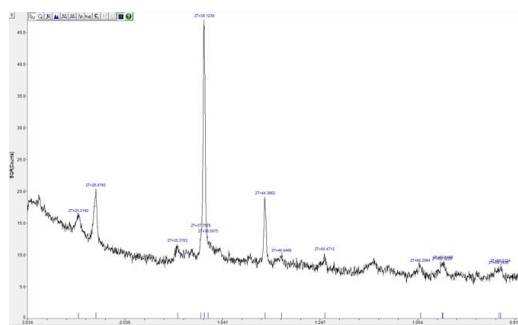


Figure 4. Diffractogram of a sample containing ED 20-100%, DBF-10%, PEPA-10%, AKF 78-15%, AKS 30-6%, and AKT 10-4% after drying at room temperature.

When we analyze the sample taken in Fig. 4 without the influence of heat light on the XRD-1600 diffractometer, we can see the increase in the absorption lines of the spectra in the 919–1340 cm⁻¹ area and hydroxide peaks in the 1300–3034 cm⁻¹ area of the composite strength and the effect on destruction.

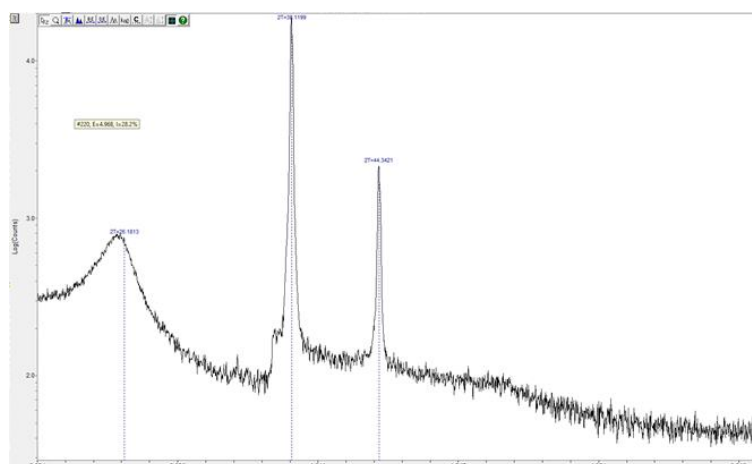


Figure 5. The following diffractogram of the sample containing ED 20-100%, DBF-10%, PEPA-10%, AKF 78-15%, AKS 30-6%, AKT 10-4%, kept in sunlight for 5 days.

As can be seen in Figure 5, when the obtained sample was exposed to natural sunlight for 5 days and analyzed on an XRD-1600 diffractometer, the absorption lines in the 919–1440 cm⁻¹ area and the increase in the peaks due to hydroxides in the 1400–3034 cm⁻¹ area can be explained by the decrease in the strength of the composite and the effect of destruction possible.

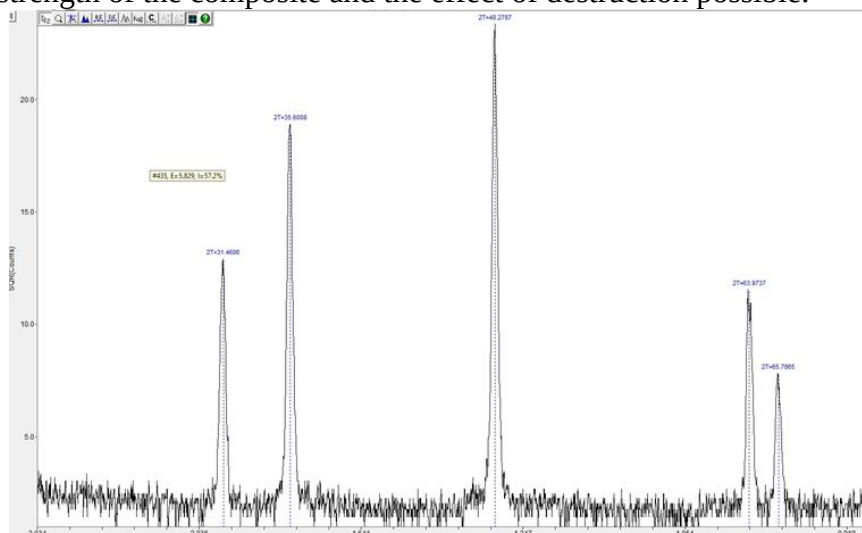


Figure 6. ED 20-100%, DBF-10%, PEPA-10%, AKF 78-15%, AKS 30-6%, AKT 10-4%, and technical carbon obtained from oil waste: 5% kept in sunlight for 5 days.

In figure 6, technical carbon extracted from oil waste is proposed as a filler in the composition of the hybrid structural polymer composite material, and after exposure to natural sunlight for 5 days, the absorption lines in the 919–1000 cm⁻¹ areas of the spectrum are shown in the analysis results obtained on the XRD-1600 diffractometer. S- and hydroxyl groups are characterized by the rise of peaks in the 1000–3034 cm⁻¹ range.

Thus, based on the research data obtained from the kinetics of processes in the temperature range from 440 K to 1023 K, the characteristics of the thermooxidation destruction of the polymer composite were studied.

The choice of a modifying system for reactive oligomers is one of the main issues in the production of binders. Polymer composite materials (PKM) with a modified polymer matrix must

have high operational properties. For this, the polymer matrix must have high reactivity and high molecular mobility, and in addition, high temperature resistance is required for the polymer matrix. This requires an increase in the glass transition temperature of the heterocomposite, which in turn leads to a decrease in molecular mobility.

Therefore, the use of hybrid fillers with a mesh structure is shown as an effective solution for obtaining a polymer composite material with high strength and high temperature resistance.

Conclusion. It was found that the optimal time for the vibro-planetary activation process of fillers in the production of hybrid structural composite materials is 30 minutes; this time increases the energy consumption of the activation process and causes the filler particles to form agglomerates.

The use of hybrid fillers with a mesh structure is considered an effective solution for obtaining a polymer composite material with high strength and high temperature resistance.

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Rezyume: Maqolada yangi tarkibli gibrid kompozit polimer materiallar olishda neft mahsulotlarini ikkilamchi qayta ishlash natijasida olingan ulgerodga boy neft qoldig'idan texnik uglerodni ajratib olish va ularni mexanik, fizik va kimyoviy faollashtirib, eposid smola asosidagi materiallarda to'ldiruvchi sifatida qo'llash borasida so'z boradi. Bundan tashqari reaktoplast asosidagi gibrid materiallar tarkibiga qo'shilgan texnik uglerodning material distruksiyalanishini oldini olishda antioksidant vazifasini bajarishi aniqlangan.

Аннотация. В статье рассмотрены вопросы извлечения технического углерода из нефтяного остатка, полученного в результате вторичной переработки нефтепродуктов и их механической, физической и химической активации до наноразмеров, а также использования его в качестве наполнителя в материалах на основе эпоксидных смол. Установлено, что нанотехнический углерод, добавляемый в состав гибридных материалов на основе реактoпласта, действует как антиоксидант, предотвращая разрушение материала.

Kalit so'zlar: Quyosh energiyasi, gibrid kompozit polimer materiallari (GKPM), geterokompozit, yopishish kuchi, mikroqattqlik, zarbiy qovushqoqlik, dispers, to'ldiruvchi, destruktsiya.

Ключевые слова: Солнечная энергетика, гибридные композиционные полимерные материалы (ГКПМ), гетерокomпозит, адгезионная прочность, микротвердость, ударная вязкость, дисперсность, наполнитель, разрушение.

**PHYSICO-CHEMICAL PROPERTIES RESEARCH OF CORROSION PROTECTION
POLYMER COATINGS BASED ON EPOXY POLYURETHANE**

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Summary: The paper studied the physicochemical properties of butylendiurethane-based epoxy polyurethane polymer coating modified by epoxy tar to obtain a butylendiurethane modifier based on urea and butanediol alcohol for corrosion-shielding polymer coatings and their dependence on temperature, time, and optimal ratios under optimal conditions as well as epoxy Tar.

Keywords: epoxy tar, polymer coating, butylendiurethane, corrosion, polyurethane, chlorsulfonated polyethylene, polymer composites.

The extraction and supply of their products from oil wells is carried out on the basis of complex technologies, and in the organization of these processes, the transportation of products formed at all technological stages through metal pipes is carried out. Pipelines make it possible in the oil and gas industry to combine the components of a chain connecting technological equipment to one into a single production complex. In the United States, Canada, the United Kingdom and a number of other countries, it is common to use polymer coatings based on epoxy tar with a thickness of 350-400 microns to protect pipes against external corrosion. Therefore, saving resources by increasing the service life of pipes can lead to greater economic efficiency in the production of new corrosion-protective polymer coatings. It is considered important to protect pipes from corrosion in increasing their operating cycle. In the oil and gas industry, the emphasis is on protecting oil and gas pipelines from soil corrosion if additives with alkaline and acidic environments in the products cause internal corrosion of metal pipes in field conditions.

In obtaining the proposed corrosion-protective polymer coatings, mainly by modifying epoxide tar and butylendiurethane-based polymers, polymer coatings of EUXP-1, EUXP-2 and EUXP-3 were obtained, and they were analyzed by IR spectroscopy as well as SEM analysis of modified epoxy tar-based polymer coatings.

In obtaining butylendiurethane, which was applied as a modifier, a reaction process based on urea and butanediol alcohol was carried out, the dependence on temperature, time, and optimal ratios under optimal conditions, as well as the effect of the catalyst were studied.

In the synthesis of butylendiurethane, a rectal flour was studied for 6 hours in different proportions, and the High 1:1 mass ratio of the compositions was determined by experimental tests. (Figure-1).

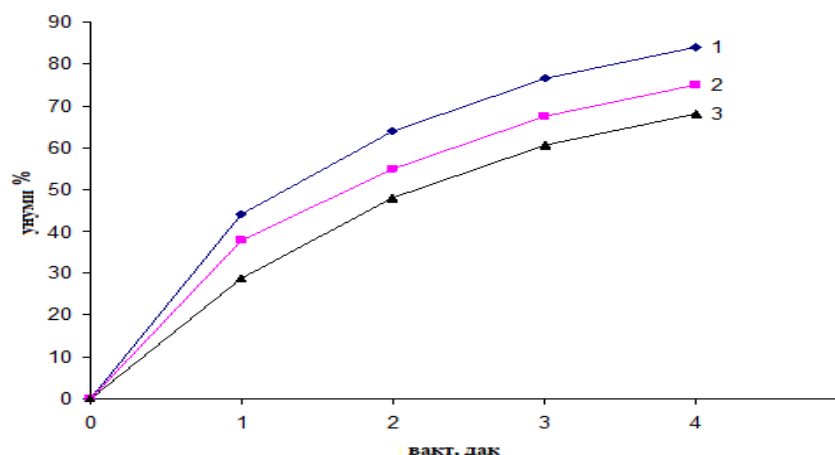


Figure-1. The dependence of the reaction product on the ratio of starting substances for the synthesis of butylenediurethane. Time is 6 hours. (1) 1:1, (2) 2:1, (3) 1:2.

On the basis of urea and butanediol alcohol, it was discovered that butylenediurethane obtained at a temperature of 180-200 °C for 6 hours in a 1:1 ratio is higher than other proportions. The physico-chemical properties of synthesized butylenediurethane are presented in Table-1.

Table 1. The effect of the mass ratio of reagents on the composition of the product when taking butylendiurethane. (T = 180os τ = 6 ch).

№	Component ratio; Urea: butandial alcohol	Temperature, °C	the amount received, %	density, кг/м ³	Solubility	Dilution temperature, °C
1	1:1	180-200	83	1,01	Dimethylformamide	230
2	2:1		70			
3	1:2		78			

When the IR spectrum of butylendiurethane is studied. There is absorption in the 1350, 1690, and 3390 sm-1 regions confirming the presence of urethane groups in IR spectra. The amine group has been found to absorb 3400 - 800 sm-1 as well as 1500 -1650 sm-1. 2913-2963 sm-1 absorption includes - CH₂ group in the lines. (Figure-2.).

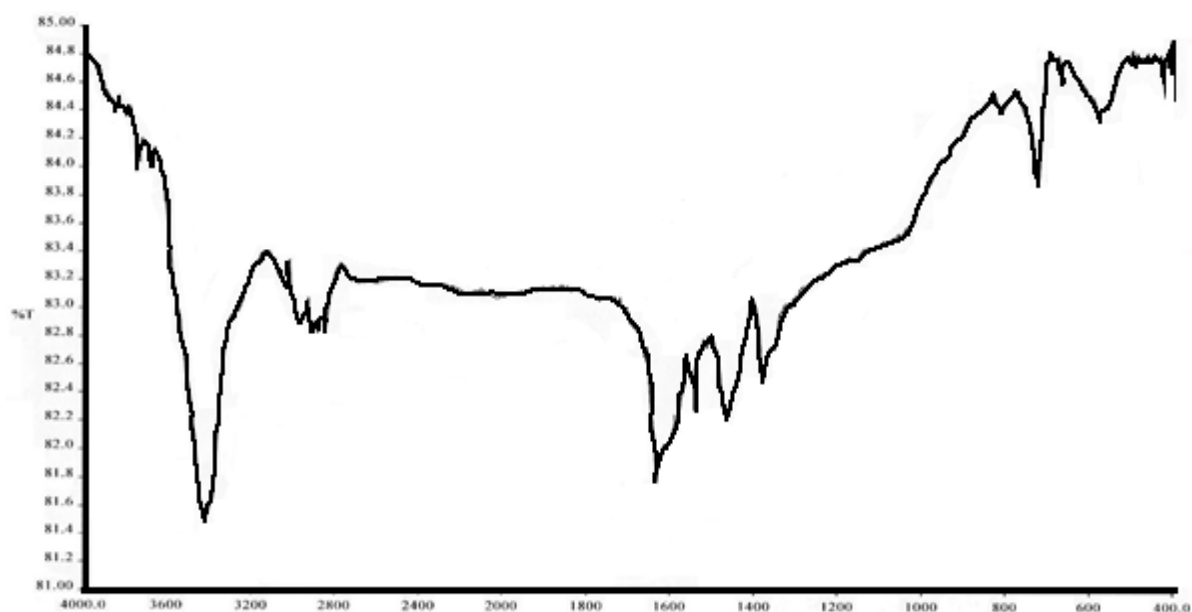


Figure-2. IR spectroscopy of butylendiurethane.

Modified with epoxy tar, butylendiurethane-based anticorrosion is applied as the first layer of polymer coating, and they have been produced in their composition with corrosion protection polymer coatings of EUXP-1, EUXP-2 and EUXP-3 brands, depending on the ratio of inhibitors, palastifiers. In our study, the structure of euxp-2 brand corrosion protection polymer coatings by IR spectroscopy, which characterize epoxide groups as well as mixtures of substances used in the formation of polymer coatings, was analyzed. From IR spectroscopy it can be seen that absorption lines characterizing epoxide Tar belong to areas 700-1050 sm-1. In addition -CH₂ gardens are considered the main one their absorption line corresponds to Valence oscillations in the area of 2980-1450 sm-1 and it was found that in the areas of 1290-1445 sm-1 oscillation, C-H held bonds belong.

The presence of absorption lines in the 3950-3400 sm-1 areas of chemical compounds containing nitrogen added to the polymer composite based on epoxide tar was determined by the results of the analysis.

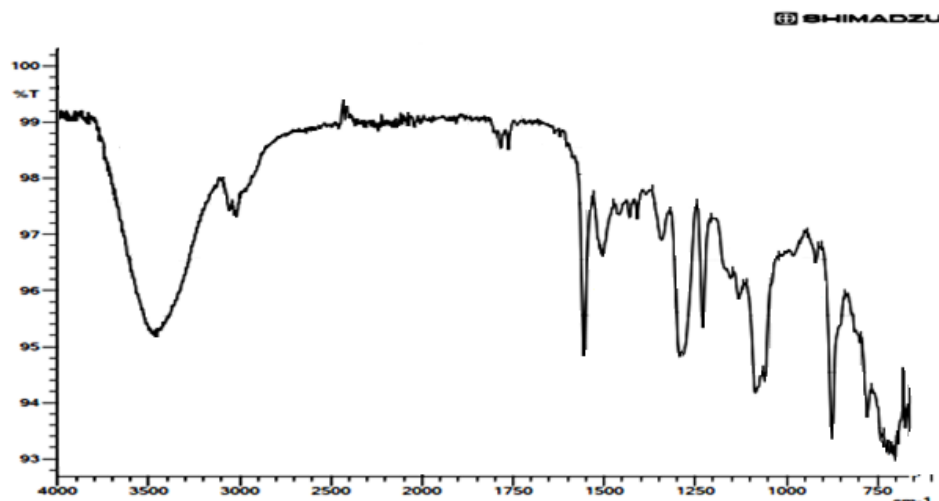


Figure-3. IR-spectroscopy analysis of a polymer coating based on EUXP-2 brand epoxide tar.

By researching scanning electron-microscope and element analyzes of epoxy polyurethane and chlorsulfonated polyethylene-based double-layer corrosion protection polymer coatings obtained at the dressing stage, the polymer composite allows you to study the mechanisms for homogenizing chemical additives in the composition and mixing and affecting nitrogen-containing compounds that are of great importance in corrosion protection. Thus, when the result of electron - microscope analysis of epoxy polyurethane and chlorsulfonated polyethylene-based insulating Composite coatings is studied, the formation of this polymer composite coating meets the requirements for products based on polymer coatings that uniformly propagate the chemicals it contains. On the polymer composite surface and its magnified electron microscope analyses, the Kura was successively mixed into particle scattering morphology.

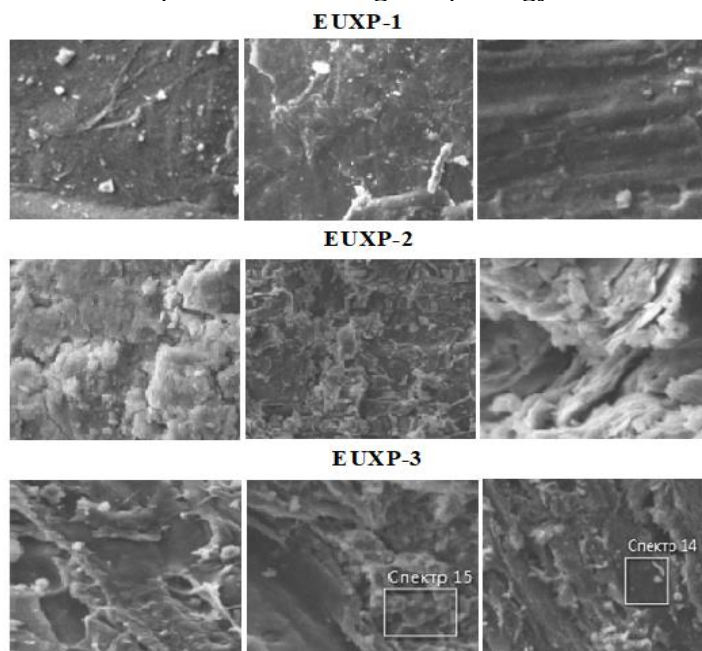


Figure-4. Electron-microscopic analysis of euxp-1, EUXP - 2, EUXP-3 brand epoxypoliurethane tar and sulfochlorinated-polyethylene-based double-layer anti-corrosion polymer coatings.

Electron-microscopic analysis of epoxy polyurethane and chlorsulfonated polyethylene-based isolating Composite coatings is shown in figure-4, which estimates the uniform distribution of chemicals containing these samples in compositional formation based on the location of various particles on the coating surface. The distribution of epoxy polyurethane and chlorsulfonated

polyethylene-based insulating composite coatings on the surface of various nitrogen groups, as well as substances of a lubricant nature in a homogeneous state, indicates that the adhesion property of these polymer composites is high. The reason is, when a polymer composite coating is viewed under an electron-microscope, it can be seen that the lok-paint complies with the requirements of the products, while mixing the composite well.

Based on these obtained studies, the use of epoxy polyurethane-based polymer coatings on the first layer of double-layer corrosion protection polymer coatings i.e. the metal-bonding part in the oil and gas industry corrosion protection of pipelines can lead to economic and environmental efficiency.

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Rezyume: maqolada epoksid smolasi asosida korroziyadan himoyalovchi polimer qoplamalar uchun karbamid va butandiol spirti asosida butilendiuretan modifikatorini olish, tahlil qilish va hossalari o'rganilgan.

Резюме: в статье изучено получение, анализ и производные модификатора бутилендиуретана на основе мочевины и бутандиолового спирта для коррозионно-защитных полимерных покрытий на основе эпоксидной смолы.

Kalit so'zlar: epoksid smolasi, polimer qoplamasi, butilendiuretan, korroziya, poliuretan, xlorosulfonlangan polietilen, polimer kompozitlari.

Ключевые слова: эпоксидная смола, полимерное покрытие, бутилендиуретан, коррозия, полиуретан, хлорсульфированный полиэтилен, полимерные композиты.

UDC: 628.31

OBTAINING COMPOSITES WITH COAGULANT-FLOCCULING PROPERTIES AND WASTE WATER TREATMENT BASED ON THEM

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Summary: *It is known that the main disruptive factor for the reuse of industrial effluents is the presence of Ca^{2+} and Mg^{2+} ions in a large amount of water, as well as their manifestation of high overall hardness. During the study, every coagulant and flocculant solution and their cross-composites were used in the treatment of industrial wastewater. The results obtained are presented in the corresponding tables. As a coagulant, it is mainly $\text{Al}_2(\text{SO}_4)_3$, FeSO_4 , FeCl_3 5, 10, 20, 50, 100, 150, 200, 250, 300, 500 mg/l solutions were used. It is prepared at room temperature by mixing the optimal amount of solutions of coagulant-specific substances ($\text{Al}_2(\text{SO}_4)_3$, FeSO_4 , FeCl_3) with solutions of 500 mg/l bentonite, kaolin, PAA, starch in 1:1 ratios with solutions of 2g/l. When the results were compared, $\text{FeCl}_3 > \text{Al}_2(\text{SO}_4)_3 \geq \text{FeSO}_4$ was found to change them by the following series of activity. Based on the results of the experiment carried out, it can be concluded that in the treatment of exactly one industrial wastewater, the effectiveness of bentonite-containing and starchy composites is determined by the following series $(\text{NB} + \text{FeCl}_3) > (\text{NB} + \text{PAA}) > (\text{NB} + \text{Al}_2(\text{SO}_4)_3) \geq (\text{NB} + \text{FeSO}_4)$.*

Key words: *Iron (III) chloride, Iron (II) sulfate, aluminum sulfate, polyacryloamide, starch, kaolin, bentonite, cations, anions, total hardness of water, cyanide, rhodanide.*

Introduction

Water is one of the very valuable natural resources. Water is of great importance in industrial production. It plays an extremely important role in all processes of hydrometallurgy. The need for water is huge and has been increasing over the years, especially since the metallurgical sector requires a lot of water. A very large amount of water is returned to water bodies in the form of effluent after its use for industrial and economic and domestic sectors. [1-4].

For the conservation of water resources from depletion and pollution and for the need of the mining industry, their efficient use is one of the most important problems and requires a quick solution in the current period. Due to the volume of processing of gold-bearing mines in hydrometallurgical plants and the acute shortage of technological water in Uzbekistan, the search for a solution and use of water-saving technology in gold hydrometallurgy is an urgent task. One such possibility is the assessment of the physicochemical properties of water content and the possibility of their use in hydrometallurgical plants. [5-6].

Historically, water quality was ignored in the development of technological schemes in hydrometallurgical plants. Drinking and even technical waters, in very many cases, satisfied technologists, dumped the used waters into water bodies. Only in recent years is this water being sent to treatment facilities and given to the process again. [7-8].

The main purpose of the work is to prepare kaogulant solutions of various compositions, study the composition of water in samples from technological processes and carry out the process of purification of sample waters using the obtained coagulants.

Experimental part

For the preparation of coagulation solutions, the following reagents were used: Iron (III) chloride, Iron (II) sulfate, aluminum chloride, aluminum sulfate, sodium hydroxide, potassium hydroxide, polyacryloamide, starch, kaolin, bentonite, lime.

Chemical analysis of water content was carried out in the laboratories of the Navoi State University of Mining and Technology "Chemical Technology". Titrimetric, photolorometric, gravimetric and atom-adsorption methods were used to quantify cations and anions. Also, to

determine the composition of the composite, the solid-state separated part was analyzed with an IQ-spectrum and X-ray.

Preparation of coagulant solutions. To prepare certain concentrations of substances with a kaogulant property in wastewater treatment, a chemical glass with a volume of 1 liter contains $\text{Al}_2(\text{SO}_4)_3$, FeSO_4 , FeCl_3 , of 5, 10, 20, 50, 100, 150, 200, 250, 300, 500, 1000 it is pulled out of mg on an analytical scale and gradually dissolved, stirring in 1 liter of water. Stir in a magnetic mixer for 2 hours in order to ensure complete dissolution of the substances. A solution of PAA, starch and kaolin with a concentration of 2 g/l is prepared.

Preparation of coagulant-flocculant solutions. It is prepared at room temperature by mixing the optimal amount of solutions of coagulant-specific substances ($\text{Al}_2(\text{SO}_4)_3$, FeSO_4 , FeCl_3 ,) with solutions of 500 mg/l bentonite, kaolin, PAA, starch in 1:1 ratios with solutions of 2g/l.

Preparation of a composite solution. A solution of FeSO_4 , FeCl_3 , ni is added from a solution of NaOH to obtain iron pentagydroxy chloride (sulfate). A polycoagulant with a complex structure is obtained by gradually adding to it a solution of PAA (starch, kaolin, bentonite).

Results and Discussion

It is known that the main disruptive factor for the reuse of industrial effluents is the presence of Ca^{2+} and Mg^{2+} ions in large amounts of water and their manifestation of high overall hardness. For the treatment of such waters, the traditional soda-lime method was usually used, but the fact that this method is a bit costly in terms of cost is now used by most enterprises only in very necessary cases.

The method of cleaning coagulation is much more convenient, but very Garden to the solvent environment. During the research period, the use of their cross-compositions from each coagulant and flocculant solution in the treatment of industrial wastewater. The results obtained are presented in the corresponding tables. Mainly the use of solutions $\text{Al}_2(\text{SO}_4)_3$, FeSO_4 , FeCl_3 as coagulants 5, 10, 20, 50, 100, 150, 200, 250, 300, 500 mg/l

Analysis of the results shows that when $\text{Al}_2(\text{SO}_4)_3$ is taken as a coagulant, the levels of the primary ions Ca^{2+} and Mg^{2+} that produce the hardness decrease from 601.2 and 486.4 mg/l respectively to the amount of the coagulant being added, e.g. Ca^{2+} - 408.3 (200 mg/l) and Mg^{2+} - 200.3 (200 mg/l), the total hardness decreased from 70.6 mg/l to 37.10 mg/l, in addition anion levels have also decreased, e.g. Cl^- -531.73 mg/l (200 mg/l) to 398.8 mg/l; SO_4^{2-} - 2157.9 mg/l (200 mg/l) to 576.4 mg/l; HCO_3^- - 1000.4 mg/l (200mg/l) to 486.4 mg/l. The solute environment varies little from pH 7,00 to 6.80, in which environment this coagulant gave a good result (Table 1).

When FeCl_3 solution was taken as the next coagulant, the following results were obtained: Ca^{2+} - 298.2 (200 mg/l) and Mg^{2+} -208.3 (200 mg/l), total hardness decreased from 70.6 mg/l to 32.26 mg/l, in addition to decreased anion content, e.g. Cl^- - 531.73 mg/l (200 mg/l)to 401.2 mg/l; SO_4^{2-} - 2157.9 mg/l (200 mg/l) to 499.2 mg/l; HCO_3^- - 1000.4 mg/l (200mg/l) to 466.2 mg/l decreased. The solute environment varies little from pH 7.00 to 6.50, in which environment this coagulant gave a good result (Table 2).

Table 1. Cleaning with coagulant $\text{Al}_2(\text{SO}_4)_3$

№	Sample location and coagulant quantity	pH	Cations mg/dm ³		Anions mg/dm ³			Total water hardness mg-ekv/dm ³
			Ca ²⁺	Mg ²⁺	HCO ₃ ⁻	SO ₄ ²⁻	Cl ⁻	
Analysis results of pre-treatment water								
1	Sample location (S-100-1)	7.00	601.2	486.4	1000.4	2157.9	531.73	70,6
Results of post-cleaning analysis								
1	5 mg/dm ³	6.80	543.2	294.2	643.2	812.3	486.3	51.67
2	10 mg/dm ³	6.80	501.6	246.2	611.9	756.0	466.2	46.59
3	20 mg/dm ³	6.80	476.4	246.2	576.8	701.2	428.4	44.33
4	50 mg/dm ³	6.80	463.4	221.5	521,3	611,0	411.3	41.62
5	100 mg/dm ³	6.80	463,4	218,1	514.2	604.2	402.1	41.23

6	150 mg/dm ³	6.80	451.8	218.1	501.1	599.1	398.8	40.76
7	200 mg/dm ³	6.80	408.3	200.3	486.4	576.4	388.2	37.10
8	250 mg/dm ³	6.80	418.6	194.2	477.8	523.6	374.2	37.11
9	300 mg/dm ³	6.80	394.2	194.2	414.2	505.0	369.1	35.89
10	500 mg/dm ³	6.80	349.2	188.3	401.4	501.2	355.1	33.15

Table 2. Cleaning with coagulant FeCl₃

№	Sample location and coagulant quantity	pH	Cations mg/dm ³		Anions mg/dm ³			Total water hardness mg-ekv/dm ³
			Ca ²⁺	Mg ²⁺	HCO ₃ ⁻	SO ₄ ²⁻	Cl ⁻	
Analysis results of pre-treatment water								
1	Sample location (S-100-1)	7.00	601.2	486.4	1000.4	2157.9	531.73	70,6
Results of post-cleaning analysis								
1	5 mg/dm ³	6.6	511.8	311.2	711.2	912.5	486.2	51.52
2	10 mg/dm ³	6.6	462.1	274.6	684.2	846.2	466.2	45.8
3	20 mg/dm ³	6.5	384,09	246,18	642.2	745.7	434.0	39.7
4	50 mg/dm ³	6.5	374.2	233.2	586.3	614.2	430.8	39.22
5	100 mg/dm ³	6.5	346.2	228.6	523.8	584,4	426,2	36.36
6	150 mg/dm ³	6.5	311.2	217.6	494.2	523.2	413.5	33.13
7	200 mg/dm ³	6.5	298.2	208.3	466.2	499.2	401.2	32.26
8	250 mg/dm ³	6.5	298.2	198.3	431.3	467.3	398.2	31.43
9	300 mg/dm ³	6.5	283.6	177.0	401.1	467.3	386.4	28.93
10	500 mg/dm ³	6.5	277.6	168.9	398.5	424.5	366.2	27.95

Under such conditions, the following results were obtained when FeSO₄, coagulant Ca²⁺ - 413.2 (200 mg/l) and Mg²⁺ - 202.8 (200 mg/l), total hardness decreased from 70.6 mg/l to 37.56 mg/l, in addition to decreased anion content, e.g. Cl - 531.73 mg/l (200 mg/l) to 401.2 mg/l; SO₄²⁻ - 2157.9 mg/l (200 mg/l) to 499.2 mg/l; HCO₃⁻ - 1000.4 mg/l (200mg/l) to 466.2 mg/l decreased. The solute environment varies less than pH 7.00 to 6.50, in which environment this coagulant gave a good result (Table 3).

Table 3. Cleaning with coagulant FeSO₄

Table 3. Cleaning with coagulant FeSO ₄								
№	Sample location and coagulant quantity	pH	Cations mg/dm ³		Anions mg/dm ³			Total water hardness mg-ekv/dm ³
			Ca ²⁺	Mg ²⁺	HCO ₃ ⁻	SO ₄ ²⁻	Cl ⁻	
Analysis results of pre-treatment water								
1	Sample location (S-100-1)	7.00	601.2	486.4	1000.4	2157.9	531.73	70,6
Results of post-cleaning analysis								
1	5 mg/dm ³	6.8	512.3	286.4	711.2	912.5	486.2	49.47
2	10 mg/dm ³	6.8	508.2	274.2	684.2	745.7	466.2	48.26
3	20 mg/dm ³	6.8	492.3	249.3	642.2	846.2	434.0	45.38
4	50 mg/dm ³	6.8	475.2	224.2	586.2	614.2	430.8	42.44
5	100 mg/dm ³	6.8	463.4	218.1	523.8	584.4	426,2	41.23
6	150 mg/dm ³	6.8	455.2	216.2	494.2	523.2	413.5	40.77
7	200 mg/dm ³	6.8	413.2	202.8	466.2	499.2	401.2	37.56
8	250 mg/dm ³	6.8	414.2	200.3	431.4	467.3	398.2	37.40
9	300 mg/dm ³	6.8	400.8	194.2	401.1	452.8	386.4	36.18
10	500 mg/dm ³	6.8	695.2	180.6	398.5	424.5	366.2	34.81

When these results were compared, it was found that their activity varies according to the following series $\text{FeCl}_3 > \text{Al}_2(\text{SO}_4)_3 \geq \text{FeSO}_4$.

The effects of the flocculant-specific substances PAA, starch and kaolins used in wastewater treatment have also been studied. It is for cleaning the same water object that these flocculants are used 5, 10, 20, 50, 100, 150, 200, 250, 300, 500 mg/l solutions were used, with results listed in tables 4-5.

Based on the results analysis, it was found that the optimal concentration for PAA was 500 mg/l, but the same value was chosen for a concentration of 200 mg/l, as well as other flocculants, in order to reduce its consumption and compare it with coagulants.

The results are as follows, PAA: Ca^{2+} - 601.2 mg/l to 411.8 (200 mg/l) and Mg^{2+} -486.4 mg/l to 211.2 (200mg/l), with a total hardness decrease from 70.6 mg/l to 38.19 mg/l, in addition to anion levels also decreased, e.g. Cl^- —531.73 mg/l (200 mg/l) to 398.8 mg/l; SO_4^{2-} - 2157.9 mg/l (200 mg/l) to 576.4 mg/l; HCO_3^- —1000.4 mg/l (200 mg/l) to 486.4 mg/l decreased. The solute environment varies little from pH 7.00 to 6.90, in this environment this flocculant gave a good result (Table 4).

Table 4. Cleaning with polyacrylamide flocculant

№	Sample location and coagulant quantity	pH	Cations mg/dm^3		Anions mg/dm^3			Total water hardness $\text{mg-ekv}/\text{dm}^3$
			Ca^{2+}	Mg^{2+}	HCO_3^-	SO_4^{2-}	Cl^-	
Analysis results of pre-treatment water								
1	Sample location (S-100-1)	7.00	601.2	486.4	1000.4	2157.9	531.73	70,6
Results of post-cleaning analysis								
1	5 mg/dm^3	7.0	512.3	328.2	643.2	812.3	486.3	52.93
2	10 mg/dm^3	7.0	486.9	319.2	611.8	756.7	466.2	50.3
3	20 mg/dm^3	7.0	466.2	286.2	576.2	701.2	428.6	47.13
4	50 mg/dm^3	7.0	432.4	247.3	521.3	634.3	411.7	42.40
5	100 mg/dm^3	7.0	428.9	246.18	514.2	604.2	402.0	41.10
6	150 mg/dm^3	7.0	421.5	233.2	501.1	599.1	398.8	40.02
7	200 mg/dm^3	6.9	409.0	211.2	486.4	576.7	386.8	38.19
8	250 mg/dm^3	6.9	389.2	203.1	477.8	523.4	374.2	36.37
9	300 mg/dm^3	6.8	369.4	199.2	414.2	505.0	369.1	35.07
10	500 mg/dm^3	6.7	317.2	188.0	401.7	499.2	355.7	31.53

Starch: Ca^{2+} - 601.2 mg/l to 446.2 (200 mg/l) and Mg^{2+} - 486.4 mg/l to 229.3 (200 mg/l), total hardness decreased from 70.6 mg/l to 41.42 mg/l, in addition to decreased anion content, e.g. Cl^- —531.73 mg/L (200 mg/l) to 342.4 mg/l; SO_4^{2-} - 2157.9 mg/l (200 mg/l) to 599.2 mg/l; HCO_3^- —1000.4 mg/l (200 mg/l) to 486.4 mg/l decreased. Similar results have been observed in the case of Kaolin. The solute environment varies little from pH 7.00 to 6.90, in this environment this flocculant gave a good result (Table 5).

Table 5. Cleaning with starch flocculant

№	Sample location and coagulant quantity	pH	Cations mg/dm^3		Anions mg/dm^3			Total water hardness $\text{mg-ekv}/\text{dm}^3$
			Ca^{2+}	Mg^{2+}	HCO_3^-	SO_4^{2-}	Cl^-	
Analysis results of pre-treatment water								
1	Sample location (S-100-1)	7.00	601.2	486.4	1000.4	2157.9	531.73	70,6
Results of post-cleaning analysis								
1	5 mg/dm^3	7.0	516.2	399.0	643.2	812.2	444.6	50.72

2	10 mg/dm ³	7.0	512.3	396.50	561.1	746.5	408.14	5031
3	20 mg/dm ³	7.0	499.2	77.1	546.8	711.9	394.5	48.05
4	50 mg/dm ³	7.0	492.1	251.6	521.4	675.4	388.2	45.65
5	100 mg/dm ³	6.9	485.4	246.7	514.7	629.3	364.2	44.61
6	150 mg/dm ³	6.9	472.1	243.0	491.1	611.0	342.3	43.25
7	200 mg/dm ³	6.9	446.2	229.4	486.4	599.4	332.8	41.42
8	250 mg/dm ³	6.9	413.4	225.7	477.8	574.8	324.6	39.47
9	300 mg/dm ³	6.8	401.1	210.9	432.4	510.4	321.0	37.62
10	500 mg/dm ³	6.8	399.9	204.4	399.1	795.3	318.4	37.06

When examining the properties of a mixture of coagulants with 2G/l suspensions of bentonite, starch and kaolins in wastewater treatment, it was found to give good results (Tables-6-7-8).

Table 6. Cleaning with suspensions of bentonite and coagulants

№	Sample location and coagulant quantity	pH	Cations mg/ <i>dm</i> ³		Anions mg/ <i>dm</i> ³			Total water hardness mg-ekv/ <i>dm</i> ³
			<i>Ca</i> ²⁺	<i>Mg</i> ²⁺	<i>HCO</i> ₃ ⁻	<i>SO</i> ₄ ²⁻	<i>Cl</i> ⁻	
Analysis results of pre-treatment water								
1	Sample location (S-100-1)	7.0	601.2	486.4	1000.4	2157.9	531.7	70,6
Results of post-cleaning analysis								
1	Bentonite 2g/l	7.0	482.1	146.18	584.3	611.0	426.6	36.21
2	Bentonite 2g/l+ Al ₂ (SO ₄) ₃ 500 mg/l	6.8	463.4	218.10	414.3	584.4	642.2	41.23
3	Bentonite 2g/l+ FeSO ₄ 500 mg/l	6.8	463.4	218.10	523.8	584.4	4262	41.23
4	Bentonite 2g/l+ FeCl ₃ 500 mg/l	6.5	384.0	146.18	414.3	541.3	411.3	31.3

When a mixture of coagulants with bentonite suspension was exposed to the above object water samples, purification results were equivalent to the following values: pH 7.0-6.7; Al₂(SO₄)₃, Ca²⁺- 601.2 mg/l to 463.4 (500 mg/l) and Mg²⁺-486.4 mg/l to 218.10 (500 mg/l), total hardness 70.6 mg/l to 41.23 mg/l, in addition anion levels have also decreased, e.g. Cl—531.73 mg/l to 642.2 mg/l (500 mg/l); SO₄²⁻ -2157.9 mg/l to 584.4 mg/l (500 mg/l); HCO₃—1000.4 mg/l to 414.3 mg/l (500 mg/l).

Table 7. Cleaning with suspensions of starch and coagulants

№	Sample location and coagulant quantity	pH	Cations mg/dm^3		Anions mg/dm^3			Total water hardness $\text{mg-ekv}/\text{dm}^3$
			Ca^{2+}	Mg^{2+}	HCO_3^-	SO_4^{2-}	Cl^-	
Analysis results of pre-treatment water								
1	Sample location (S-100-1)	7.0	601.2	486.4	1000.4	2157.9	531.7	70,6
Results of post-cleaning analysis								
1	Starch 2g/l	7.0	482.1	243.0	584.3	611.0	446.2	44.25
2	Starch 2g/l+ $\text{Al}_2(\text{SO}_4)_3$ 500 mg/l	6.8	463.4	218.1	546.4	654.2	642.2	41.31
3	Starch 2g/l+ FeSO_4 500 mg/l	6.8	463.4	226.9	523.8	614.8	426.2	42.04
4	Starch 2g/l+ FeCl_3 500 mg/l	6.5	384.0	196.18	443.0	441.3	411.3	35.35

Table 8. Cleaning with suspensions of Kaolin as well as coagulants

№	Sample location and coagulant quantity	pH	Cations mg/dm^3		Anions mg/dm^3			Total water hardness $\text{mg-ekv}/\text{dm}^3$
			Ca^{2+}	Mg^{2+}	HCO_3^-	SO_4^{2-}	Cl^-	
Analysis results of pre-treatment water								
1	Sample location (S-100-1)	7.0	601.2	486.4	1000.4	2157.9	531.7	70,6
Results of post-cleaning analysis								
1	Kaolin 2g/l	7.0	514.8	213.8	584.3	611.0	446.2	43.49
2	Kaolin 2g/l+ $\text{Al}_2(\text{SO}_4)_3$ 500 mg/l	6.8	411.4	222.0	546.7	614.8	542.2	40.07
3	Kaolin 2g/l+ FeSO_4 500 mg/l	6.8	411.4	269.0	523.4	614.8	526.7	42.93
4	Kaolin 2g/l+ FeCl_3 500 mg/l	6.5	422.0	211.2	443.0	514.3	541.3	38.66

In the case of FeSO₄, both Ca²⁺- 601.2 mg/L to 463.4 (500 mg/l) and Mg²⁺-486.4 mg/l to 218.10 (500 mg/l), the total hardness decreased from 70.6 mg/l to 41.23 mg/l, in addition to decreased anion content, e.g. Cl—531.73 mg/l to 426.6 mg/l (500 mg/l); SO₄²⁻—2157.9 mg/l to 584.4 mg/l (500mg/l); HCO₃⁻—reduced from 1000.4 mg/l to 523.8 mg/l (500 mg/l) is very close to the coagulant value above.

The results of a 2g/l suspension solution mixture of bentonite with a concentration solution of FeCl₃ 500 mg/l are as follows Ca²⁺- 601.2 mg/l to 384.09 mg/l (500 mg/l) and Mg²⁺-486.4 mg/l to 146.18 mg/l (500 mg/l), with a decrease in total hardness of 70.6 mg/l to 31.3 mg/l, in addition to decreased anion levels, such as Cl—decreased from 531.73 mg/l to 411.3 mg/L (500 mg/l); from SO₄²⁻—2157.9 mg/l to 541.3 mg/l (500mg/l); from HCO₃⁻—1000.4 mg/l to 414.3 mg/l (500 mg/l).

Hence, based on the results of the experiment carried out, it can be concluded that when treating exactly one industrial wastewater, the efficiency of bentonite composites varies by series as follows (NB+ FeCl₃) > (NB+PAA) > (NB+ Al₂(SO₄)₃) ≥ (NB+ FeSO₄).

In experiments with starch and kaolin, results of exactly the same sequence were also obtained (Table-7-8).

Conclusion

1. In wastewater treatment, the effects of coagulants and flocculants in neutral environments were first studied in relation to S-100-1 production wastewater.

2. When the results studied were compared, it was found that FeCl₃>Al₂(SO₄)₃ ≥ FeSO₄, whose activity varies according to the following series.

3. Based on the results of the experiment carried out, it can be concluded that in the treatment of exactly one industrial wastewater, the effectiveness of bentonite and starch Composites was determined by the following number of variations (NB+FeCl₃) > (NB+PAA) > (NB+Al₂(SO₄)₃) ≥ (NB+ FeSO₄).

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Rezyume: *Ma'lumki sanoat oqova suvlaridan qayta foydalanish uchun asosiy xalaqit qiluvchi omil Ca^{2+} va Mg^{2+} ionlarining katta miqdorda suvda bo'lishi, hamda ularning yuqori umumiy qattiqlik namoyon qilishidir. Tadqiqot davomida sanoat oqav suvlarini tozalashda har bir koagulyant va flokulyant eritmalaridan hamda ularning o'zaro kompozitlaridan foydalanildi. Olingan natijalar tegishli jadvallarda keltirilgan. Koagulyant sifatida asosan $Al_2(SO_4)_3$, $FeSO_4$, $FeCl_3$ 5, 10, 20, 50, 100, 150, 200, 250, 300, 500 mg/l eritmalaridan foydalanilgan. Koagulyant xossalari moddalar ($Al_2(SO_4)_3$, $FeSO_4$, $FeCl_3$,) eritmalarini optimal miqdorini 500 mg/l bentonit, kaolin, PAA, kraxmalning 2g/l eritmalarini bilan 1:1 nisbatlarda aralashtirgan holda xona haroratida tayyorlangan. Natijalar o'zaro solishtirilganda ularni faolligi quyidagi qator bo'yicha o'zgarishi $FeCl_3 > Al_2(SO_4)_3 \geq FeSO_4$ aniqlangan. Olib borilgan tajriba natijalari asosida xulosa qilish mumkinki, aynan bitta sanoat oqova suvlarini tozalashda bentonitli va kraxmalli kompozitlar samaradorligi quyidagi qator bo'yicha $(NB+ FeCl_3) > (NB+PAA) > (NB+ Al_2(SO_4)_3) \geq (NB+ FeSO_4)$ o'zgarish aniqlangan.*

Резюме: *Известно, что основным мешающим фактором для повторного использования промышленных сточных вод является наличие в воде большого количества ионов Ca^{2+} и Mg^{2+} , а также их высокая общая жесткость. В ходе исследования при очистке промышленных сточных вод использовались растворы каждого из коагулянтов и флокулянтов, а также их перекрестные составы. Полученные результаты представлены в соответствующих таблицах. В качестве коагулянта в основном используется $Al_2(SO_4)_3$, $FeSO_4$, $FeCl_3$ 5, 10, 20, 50, 100, 150, 200, 250, 300, 500 применялись растворы в мг/л. Готовят при комнатной температуре путем смешивания оптимального количества растворов веществ, обладающих коагулянтными свойствами ($Al_2(SO_4)_3$, $FeSO_4$, $FeCl_3$) с 500 мг/л растворов бентонита, каолина, пaa, 2г/л крахмала в соотношении 1:1. Когда результаты сравнивались друг с другом, их изменение активности по строке ниже $FeCl_3 > Al_2(SO_4)_3 \geq FeSO_4$ был обнаружен. По результатам проведенного эксперимента можно сделать вывод, что эффективность бентонитовых и крахмальных композитов при очистке ровно одной промышленной сточной воды определяется изменением $(NB+ FeCl_3) > (NB+PAA) > (NB+ Al_2(SO_4)_3) > (NB+ FeSO_4)$ в следующем ряду.*

Kalit so'zlar: *temir (III) xlorid, temir (II) sulfat, alyuminiy sulfat, poliakriloamid, kraxmal, kaolin, bentonit, kationlar, anionlar, suvning umumiy qattiqligi, sianid, rodanid.*

Ключевые слова: *хлорид железа (III), сульфат железа (II), сульфат алюминия, полиакрилоамид, крахмал, каолин, бентонит, катионы, анионы, общая жесткость воды, цианид, роданид.*

UDC 621.787

SIMULATION OF THE CUTTING PROCESS DURING ABRASIVE BLAST PROCESSING OF METAL PRODUCTS

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Summary: *The features of abrasive blasting of metal products are presented regarding micro-cutting with a new abrasive material - cooper slag, which has a high cutting ability with sharp edges that create the necessary angle of the cutting wedge. Micro-cutting forces were analytically determined depending on the tensile strength of the processed material, the cross-sectional area of the cut layer, as well as a coefficient taking into account the structural state.*

Key words: *free abrasive, abrasive blasting, cutting wedge, cutting angles, impact force, micro-cutting force, cross-sectional area, particle radius.*

Introduction

The most important requirement of modern machine-building production is the technological provision of surface quality and operational characteristics of critical parts of working parts of machines using finishing machining operations, among which the leading place is occupied by processing methods in an abrasive environment [1-4].

When processing with free abrasives, compared to processing with bound abrasive particles in the form of a grinding wheel, the cutting properties of grains can be more fully used due to their reorientation during processing and the relatively uniform distribution of their cutting edges over the processed surface of the part. This circumstance, as well as the lower processing temperature compared to traditional grinding, contribute to the formation of a high-quality processed surface without burns, microcracks and undesirable structural-phase transformations.

A significant advantage of processing methods with free abrasives is the ability to implement surface treatment of parts of complex configurations made of various structural materials and a large size range. In this case, relatively simple and reliable equipment is used, both mass-produced industrial designs and in the form of in-plant auxiliary equipment, for example, sandblasting machines.

The choice of method for processing machine parts with free abrasives (centrifugal - rotational, vibroabrasive, abrasive blasting) is based on the features of the process associated with its kinematic and dynamic, as well as technological capabilities. At the same time, the purpose of this mechanical processing is to perform such operations as removing burrs and rounding sharp edges, finishing workpieces and cleaning the surface, strain hardening, preparing workpieces before applying various coatings, etc. A limitation when choosing a processing method with free abrasives can be the size and shape of the processed materials. parts, surface quality requirements.

Thus, the processing of large, low-rigidity and thin-walled parts in the form of saw blades for cotton processing machines is effectively carried out in conventional sandblasting machines using directed and controlled flows of free abrasive particles [4]. The purpose of the treatment is to remove sharp burrs from the front and rear surfaces of the teeth of saw blades with a diameter of 320 m, formed after cold cutting of teeth on special sawing machines.

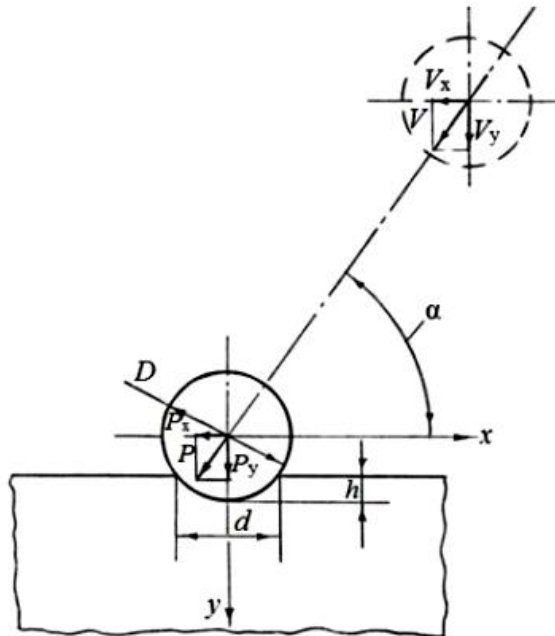
Contact interaction upon impact of an abrasive particle

Abrasive blasting, carried out by a flow of free particles, is characterized by a polydeformation process, which is advisable to simulate at the contact by a single-act collision of an abrasive particle with a flat steel surface - an elastic half-space, followed by solving the contact problem of pressing this particle into the half-space at different angles of attack with a variable mass (diameter) and impact speed.

The process of microcutting with a free abrasive can be likened to the process of grinding with a separate grain of a wheel, producing a single microcut (scratching) of the surface layer of the material. It is important to note that the mechanism of chip formation during grinding is not fundamentally different from chip formation during cutting with a blade tool [5, 6], but has its own characteristics due to high deformation rates, large negative rake angles of the cutting wedge, small cut thickness and contact duration.

Analysis of abrasive blasting is based on the assumption that at the moment of indentation (at the active stage of the impact), the abrasive particle is not destroyed and the impact speed is significantly lower than the speed of propagation of elastic waves of compression and shear, which is confirmed experimentally [7]. Therefore, this contact problem can be solved quasistatically, i.e. consider that the mutual movements of the abrasive particle, half-space and force in the contact zone are related by static equations [8].

The force dependencies when processing with free abrasive must be considered taking into account the kinematic features of abrasive blasting, when an abrasive particle of mass m flies at an angle of attack α onto the surface being processed with a speed v developed under the pressure p of compressed air (Fig. 1).



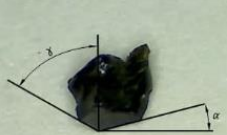
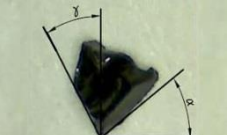
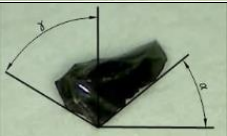
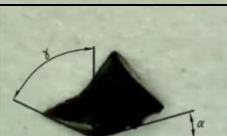
Rice. 1. Contact interaction when an abrasive particle hits a metal surface:
 d and h – diameter respectively and hole depth

The contact interaction of an impacting abrasive particle on a metal surface, provided that its kinetic energy is sufficient, is characterized by elastoplastic penetration and subsequent sliding along the formed dimple depending on the angle of attack α . At the end of these processes, the abrasive particle rebounds from the contact surface due to the manifestation of elastic forces aimed at restoring the elastically deformed metal layer.

The impact force P , considered as a reaction on the part of the material being processed, taking into account its physical and mechanical properties to the external influence of the abrasive particle, is considered to be applied at its center and represented on the plane in the form of a circle during the modeling process (Fig. 1). The vertical component of the impact force $P_y = P \sin \alpha$ causes the abrasive particle to be pressed into the metal barrier, forming a plastic imprint (crater) with parameters d and h . Under the influence of the horizontal component of the impact force $P_x = P \cos \alpha$ the abrasive particle receives some sliding along the formed hole, transforming it in the direction of movement along the x axis. Since the abrasive particle has sharp cutting edges (table), with relative movement microcutting occurs with the formation of tiny chips converging along the front surface of the cutting wedge of abrasive grain.

Table

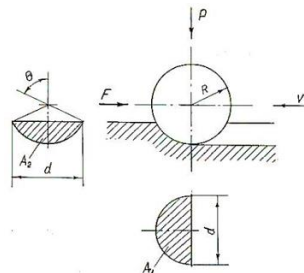
The shape of abrasive particles of cooper slag and cutting angles for a given cutting wedge

No	Abrasive particle	Cutting angles, degrees	
		Rake angle γ	Relief angle α
1		- 58° 22'	15° 41'
2		- 30° 49'	35° 40'
3		- 59° 26'	38° 19'
4		- 52° 39'	18° 43'
5		- 64° 4'	15° 56'

Thus, a significant feature of the processing of metal surfaces with a free abrasive has been revealed, when the cut layer in the microcutting process is determined by part of the depth of indentation of the abrasive into the material upon impact. When processing with a bound abrasive in the form of a circle during the grinding process, the thickness of the cut layer, as is known [9, 10], is determined by both the operational and geometric parameters of the tool.

Micro-cutting forces during abrasive blasting

In accordance with Fig. 1, when an abrasive particle moves under the action of the impact force component $P \cos \alpha$ in the direction of the x axis, micro-cutting (“plowing”) of the contact surface of the metal occurs at a depth h . The micro-cutting process is accompanied by plastic displacement of the metal within the contact area. In this case, the “plowing” area A_2 is defined as the difference between the areas of a circular sector with an angle of 2θ and an imaginary isosceles triangle (Fig. 2):



Rice. 2.3. Scheme of sliding of a hard spherical particle over a softer metal barrier: A_1

– contact surface area; A_2 – cross-sectional area of the groove; P and

F – respectively applied normal force and frictional resistance force

$$A_2 = \frac{1}{2} R^2 (2\theta - \sin 2\theta), \text{ mm}^2 \quad (1)$$

where R – radius of the abrasive particle, mm;

2θ - angle of the circular sector, degrees.

Taking into account the features of abrasive blasting of metal surfaces and, above all, its polydeformation and probabilistic nature, to approximate the level of microcutting forces we use the relationship [9]:

$$P_{\text{рез}} = e \tau A_{\text{cp}}, \text{ N} \quad (2)$$

where τ is the tangential stress acting in the shear plane (shear) over its entire area in a thin surface layer of plastically deformable metal, N/mm²;

A_{cp} - cross-sectional area of the cut layer, mm²;

e - coefficient taking into account the influence of all dimensionless quantities (f_1 - coefficient of external sliding friction of the processed and tool materials; f_2 – coefficient of internal friction in a plastically deformable metal), rake angle γ and shear angle β , determined by the formula

$$e = \frac{(1 - f_1)^2 \cos \gamma + 2 f_1 \sin \gamma}{\sin \beta [(1 - f_1 f_2) \cos(\gamma - \beta) + (f_1 + f_2) \sin(\gamma - \beta)]} \quad (3)$$

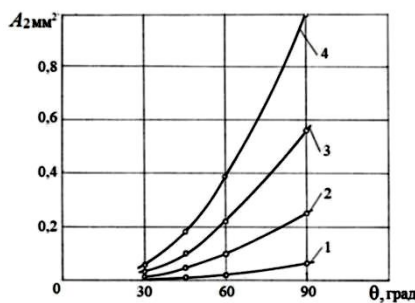
Analysis of dependence (3) shows that it includes quantities that are determined experimentally and require a lot of labor: the coefficient of internal friction f_2 , shear angle β . Therefore, in accordance with G.I. Granovsky we replace the product $e\tau$ in (2) with the equivalent product $K_p \sigma_B$, where σ_B is the tensile strength processed metal in tension; $K_p = 2,3...2,8$ - coefficient depending on the chemical composition, structural state and mechanical properties of structural steels: $K_p \approx 2,5$ - for carbon structural steels. Thus, the simplified cutting force equation takes the form

$$P_{\text{рез}} = K_p \sigma_B A_{\text{cp}}, \text{ N} \quad (4)$$

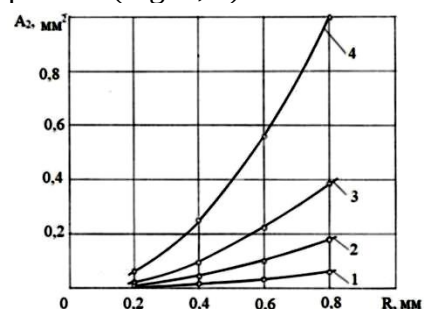
where K_p is the cutting coefficient, expressing the specific cutting resistance of the metal of the workpiece

If the tensile strength σ_B of the steel is unknown, but the Brinell hardness is known HB , then with a sufficient degree of accuracy the tensile strength can be determined by the relation $\sigma_B \cong (0,31...0,34) HB$.

Figure 3a shows the dependence of the area A_2 on the angle θ during microcutting in the process of impact and sliding of an abrasive particle with radius R on a softer metal base. As follows from the graphs, these dependencies are nonlinear and increasing. A similar dependence was revealed for the cut area on the radius R of the abrasive particle (Fig. 3, b).



a)



b)

Rice. 3. Dependence of the cut area A_2 on the angle θ

(a): 1- $R = 0.2$ mm; 2- 0.4 mm; 3- $R = 0.6$ mm; 4- $R = 0.8$ mm; and from radius R abrasive particle (b) 1- $\theta = 30^\circ$; 2- $\theta = 45^\circ$; 3- $\theta = 60^\circ$; 4- $\theta = 90^\circ$

θ increases, a sharp increase in the cut area $A_2=A_{cp}$ is observed. Thus, at $\theta =45^0$, the area A_{cp} increases in relation to $\theta=30^0$ by 3.15 times, and at $\theta=60^0$ by 6.78 times. With increasing radius R (Fig. 3,b) a similar pattern takes place: with respect to $R=0.2$ mm, the cut area A increases significantly, for example, at $R=0.4$ mm - 4 times, at $R=0.6$ mm - in 9 times.

The numerical experiment was carried out under the following conditions and assumptions:

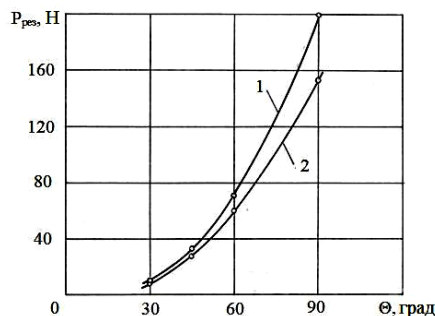
1) The processed material is U8G steel with a carbon content of 0.8% C, used for the manufacture of the main part of fiber separation machines (gins and linters) - saw blades.

Tensile strength $\sigma_b = 1150$ N/mm², hardness HRA 67-70. We find the yield strength σ_T using the approximate dependence $\sigma_T \approx HB / 6$, where $HB = \sigma_b / (3,1...3,4)$. Taking these relations into account, we obtain

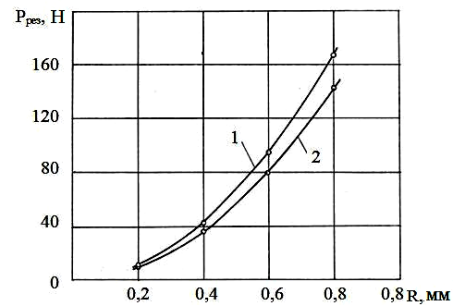
$$HB \approx 338; \quad \sigma_T = 338 / 6 = 56,3 \text{ kgs/mm}^2 \cong 563 \text{ N/mm}^2 \quad (5)$$

2) Angle of attack values accepted $\alpha = 30^0, 45^0$ and 60^0 . At these angles, due to the sliding of a solid abrasive particle over the metal surface, micro-cutting and partial removal of burrs from the teeth and smoothing of their surfaces occur.

3) When calculating the auxiliary coefficient C_1 , we assume that the relative shift angle β_1 according to [5] is in the range $6...20^0$. Small values of this angle appear when the thickness of the chip shear elements is in the range of 1...5 mkmm for cut thicknesses equal to several micrometers, and the negative rake angle of the cutting wedges is large in absolute value. The average value was taken in the calculations $\beta_1 = 13^0$.



a)



b)

Rice. 4. Dependence of the cutting force P_{cut} on the angle θ (a) during abrasive blasting of steels U8G (1) and 65G (2), as well as on the radius R of the abrasive particle (b) during abrasive blasting of steels U8G (1) and 65G (2)

As follows from the graphical representations of the cutting force dependences P_{pes} on the angle θ (Fig. 4, a) and on the radius R of the abrasive particle (Fig. 4,b), a pattern is observed in the form of a sharp increase in a nonlinear form from the parameters under consideration. Taking into account the directly proportional dependence of the cutting force P_{pes} from the cut area A_2 , characterized by the values of R and θ , the pattern of force increase is the same as for A_2 .

The value of the forces arising during micro-cutting during abrasive blasting allows us to generally determine the impact force at a given angle of attack α of abrasive particles. The obtained values of the impact force are comparable with the characteristics of the force action during pneumodynamic hardening and hardening with microballs [11], which allows them to be used in calculation practice when estimating the parameters of the stress-strain state of the surface layer of parts through residual stresses, depth and degree of hardening, and dislocation density.

Conclusions

1. The process of abrasive blasting is modeled by a single-act collision of an abrasive particle on a metal surface - an elastic half-space.

2. It has been established that an abrasive particle made from cooper slag has high cutting properties, the cutting edges of which create large negative rake angles that promote the formation

of microchips with a small cut thickness, as when cutting with a bound abrasive in a grinding wheel.

3. The calculated value of microcutting forces, obtained using a simplified formula, allows, taking into account the angle of attack, to determine the impact force of an abrasive particle, which is comparable with the data of experimental studies of other authors during impact surface- oplastic deformation.

4. The force of contact interaction upon impact is a fundamental parameter for assessing the stress-strain state, residual stresses, depth and degree of deformed hardening, which affect the operational properties and allow the creation of various models for predicting the performance of machine parts.

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Rezyume: *Metall buyumlariga abraziv oqimli ishlov berish xususiyatlari yangi abraziv material - kupershlak bilan mikro kesish bilan bog'liq bo'lib, u o'tkir qirralar bilan yuqori kesish qobiliyatiga ega bo'lib, kesuvchi qirraning kerakli burchagini yaratadi. Mikro-kesuvchi kuchlar qayta ishlangan materialning kuchlanish kuchiga, kesilgan qatlamning kesishish maydoniga, shuningdek, strukturaviy holatni hisobga olgan holda koeffitsientga qarab analitik tarzda aniqlangan.*

Резюме: *Приведены особенности абразивоструйной обработки металлических изделий, касающиеся микрорезания новым абразивным материалом – купершлаком, имеющим высокую режущую способность с острым кромками, создающими необходимый угол режущего клина. Аналитически определены силы микрорезания в зависимости от предела прочности обрабатываемого от предела прочности обрабатываемого материала, площади поперечного сечения срезаемого слоя, а также коэффициента, учитывающего структурное состояние.*

Kalit so'zlar: *erkin abraziv, abraziv oqimli ishlov berish, kesish qirrasi, kesish burchaklari, zarba kuchi, mikro kesish kuchi, kesish maydoni, zarrachalar radiusi.*

Ключевые слова: *свободный абразив, абразивоструйная обработка, режущий клин, углы резания, сила удара, сила микрорезания, площадь сечения, радиус частицы.*

**PHYSICAL AND MECHANICAL PROPERTIES OF SEALING LUBRICATING OILS
CONTAINING LITHIUM RESEARCH**

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Summary: *The paper synthesized sealing lubricating oils containing lithium experimental test work of these UP-1 and UP-2 brand sealing lubricating oils based on comparison of the test results of the sample presented to determine high pressure resistance with its regulatory data, on the physicochemical properties of lubricating oils TSH 38.101315-72 was investigated.*

Keywords: *sealing lubricating oils coefficient of friction, lithium hydroxide, fatty acids, gas consumption.*

Today, ball cranes, which are used at high pressure in gas pipelines, are more effective in terms of application. These ball cranes are in high demand due to their compactness, ease of Use and maintenance.

Due to the internal friction of the valves of the cranes and the speed of corrosion caused by impurities in the gas, as well as friction on the metal surface of them, damage to the working surfaces occurs in the internal devices of ballpoint cranes, as a result of which gas leaks into the atmosphere, which causes a number of problems - can lead to pressure changes Therefore, the processing of ball taps applied at high pressure in gas pipelines with special compacting surkov oils and improving the efficiency of their operation are considered to be the parts of technological processes for which the main attention is required. The correct selection of special sealing lubricating oils offered for ball cranes used in gas pipelines helps to reduce friction in the crane, which reduces the rate of less corrosion and, as a result, increases the efficiency of plan-based processing processes.

In comparison with conventional (multi-purpose) lubricating oils, it is necessary that the sealing lubricating oils have good adhesion and compaction properties, are stable to external and internal influences, that the lubricating compositions in the components have low friction during the work process, that is, ensure the stability of the friction coefficients.

This article presents the analysis and physical chemical properties of sealing lubricating oils, which we proposed, stored lithium in a high-pressure gas pipeline.

Sealing lubricating oils have been produced for use in the petrochemical industry. Sealing lubricating oils, which contain lithium, are mainly composed of lithium hydroxide, fatty acids and fillers.

Table-1. Extraction of sealing lubricating oils containing lithium and analysis of properties

Properties of sealing lubricating oils	Sealed lubricating oils
The strength limit of lubricating oils, Pa, 50°C, 80°C	890 660
Colloidal stability, %	3,1
Drop temperature, °C (drop point)	260

When obtaining sealing lubricating oils containing lithium, the effect on the reaction productivity of the temperature was established. The results obtained showed that the ratio of

lithium hydroxide to the lubricant acid soapy reaction is 100-110 °C temperature is optimal for this reaction. The effect of temperature on the product of the soapy reaction of fatty acids with lithium hydroxide is shown in the graphs below.(Figure-1).

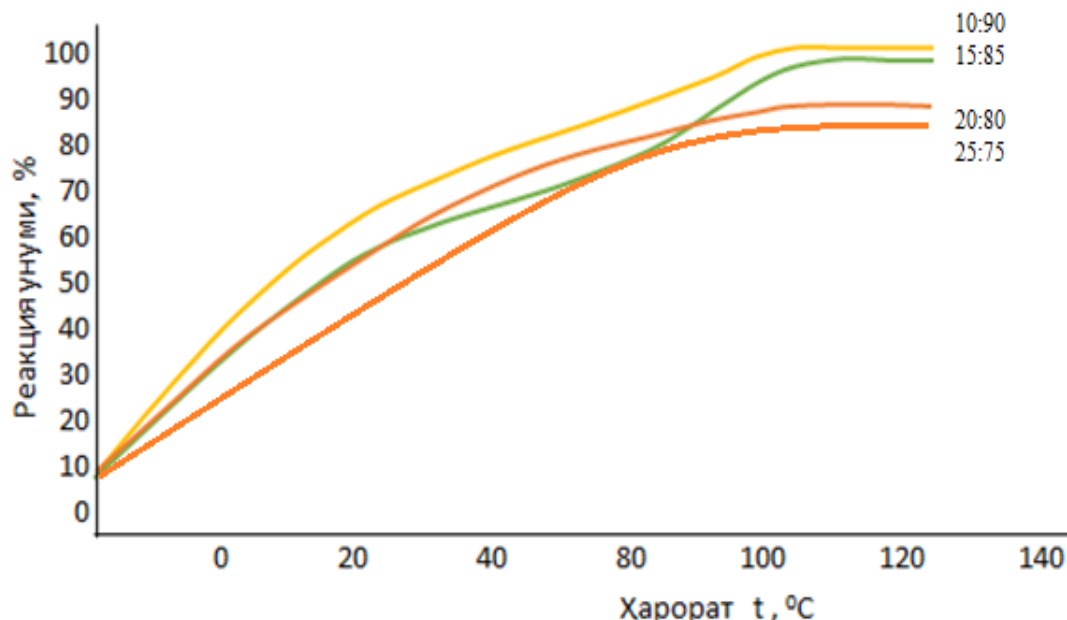


Figure-1. The effect of temperature on the product of the soapy reaction of fatty acids with lithium hydroxide.

Sealing lubricating oils are made using the same technology. Homogenization of sealing lubricating oils was carried out at a temperature not higher than 50°C.

Sealing lubricating oils containing lithium were synthesized at the Tashkent Scientific Research Institute of Chemical Technology, and experimental testing of these up-1 and up-2 brand sealing lubricating oils was carried out on the territory of the Tashkent main gas administration (Toshmgb). The Toshmgb organization carried out initial tests of pressure stability of sealing lubricating oils using technical equipment that can be applied in practice to determine the high pressure resistance of sealing lubricating oils. This technical equipment is equipped with a gas pressure control valve and a pressure gauge. The technical equipment is controlled by Toshmgb technicians and primary results are obtained for initial experiment testing processes. The pressure is increased by water in primary experiments. In dressing experiments, this process is carried out with gas. In the process of experimental testing of sealing lubricating oils of various compositions in technological equipment, direct gas flow is based on the compaction mechanism of the valve model.

In the experimental testing of sealing lubricating oils, studies are carried out on the sheep to study the compaction mechanism of the direct gas flow valve model:

1) to remove pre-tested sealing lubricating oils from the surface of the valve and body, the crane is disassembled; 2) washing the inner cavity and plug of the crane body with a solvent, wiping the surfaces, drying is carried out; 3) assembling the crane parts and cleaning the lubricants between the valve and the body; 4) filling the designated system for lubricating the crane sealing lubricating oils are of great importance in the general assessment of the properties of gas leakage, adjusting the initial gas gaps using a valve and are created in order to accurately obtain analyzes.

Densifying lubricating oils studied as analogs were placed in tap cavities and when the pressure on their stability reached 10 kgs/sm² when the gas pressure was removed from tests with high pressure, the gas output was found and the resulting pressure was reduced. After that, the crane was disassembled and cleaned, supplemented with UP-1 branded sealing lubricating oils

synthesized in TKTITI. After that, a decrease in pressure in the pressure gauge was observed at 20 kgs/ sm².

Table-2. Sealing lubricating oils containing lithium physical and mechanical properties

Name	Appearance	Density g/sm ³	Pressure resistance kgs/sm ²
Imported compacting surkov oils (analog)	White, flexible mass	0,8667	10
UP-1 (Synthesized in TKTITI)	Light yellow, firm, flexible mass	0,8565	20
UP-2 (Synthesized in TKTITI)	White, hard, flexible mass	0,8588	20

Table-3. Research of the studied properties based on comparison of UP-1 and UP-2 brand sealing lubricating oils containing lithium with regulatory data

Specification name	Standard requirements for testing methods	-	Test results	Match results
1	2	3	4	5
Appearance	General observation	Light yellow, firm, flexible mass	Light yellow, solid, flexible mass without mechanical impurities	According
Temperature change, °C,	GOST 6793	60	89	According
Corrosion to metals, not more than %	GOST 9.080	stable	stable	According
Mass fraction of water, not more than %	GOST 2477	3.5	2.3	According
Penetration limit, at 25 °C	GOST 5346	35-70	63	According
The composition of mechanical mixtures, no more	GOST 6707	0,05	0,017	According
The composition of water-soluble acids and hydroxides, no more	GOST 6707	no	no	According
Coking power at 520 °C 30 minutes, %	GOST 8852	-	9 754	According

Based on a comparison of the test results of the presented sample with its regulatory data, it was concluded that the compactor corresponds to the technical characteristics of TSH 38.101315-72 in terms of physicochemical properties of surkov oils.

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Rezyume: Maqolada litiy saqlagan zichlashtiruvchi surkov moylari sintez qilingan bo'lib ushbu up-1 va up-2 markali zichlashtiruvchi surkov moylarini tajriba sinov ishlari yuqori bosimga chidamliligini aniqlash uchun taqdim etilgan namunaning sinov natijalarini uning me'yoriy ma'lumotlari bilan taqqoslash asosida, zichlashtiruvchi surkov moylarini fizik-kimyoviy xususiyatlari bo'yicha TSH 38.101315-72 texnik xususiyatlariga mosligi tadqiq etildi.

Резюме: В статье синтезированы смазочные масла, содержащие литий, на основе сравнения результатов испытаний представленных образцов на устойчивость к высокому давлению с нормативными данными по физико-химическим свойствам компакт-масел марки ТШ 38.101315-72 были проведены экспериментальные испытания компакт-масел марок уп-1 и уп-2.

Kalit so'zlar: zichlashtiruvchi surkov moylari, ishqalanish koeffisienti, litiy gidroksid, moy kislotalari, gaz oqimi.

Ключевые слова: уплотняющие смазочные масла, коэффициент трения, гидроксид лития, жирные кислоты, расход газа.

PRODUCTION OF POLYPROPYLENE BAGS

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Summary: *The article presents the production of polypropylene bags, in particular, the technology for the production of bags and bag fabrics, the technological process of processing and preparing raw materials for weaving, the equipment and their features for the production of bags and bag fabrics are selected and justified.*

Key words: *thread, warp, weft, fabric, breakage, bag.*

In the Republic of Uzbekistan with its own raw material base, it is important to develop the production of high-quality and competitive bag fabrics and, as a result, saturate the domestic market with these products (and thus reduce the share of imports) and achieve good export opportunities. Polypropylene bags are often used for storing, transporting and packing food and non-food products. They have a fairly low cost and wide application. Polymer packaging is practical and greatly simplifies the sale of products. Such packaging is more often used for packaging bulk food products (sugar, salt, cereals), fertilizers, and building materials.

The maximum weight of the bag contents depends on the size and density of the bag and can reach several hundredweight units. Also, polypropylene bags are packaging containers designed for storing and transporting bulk building materials, small parts, mineral fertilizers, chemicals, mixed feed, as well as agricultural products. The function of these bags is to protect the product from damage. Therefore, the production of this type of packaging requires the use of advanced technologies and high-quality raw materials in order to obtain high-quality finished products. Produce polypropylene fabric width-28cm, 33cm, 38cm, 40cm, 42cm, 50cm, 55cm, 57cm, 65cm, 78cm, from which you can make the length of the bag container of any size. It is also possible to produce a laminated bag and a laminated one with a marking film attached. The production process of polypropylene bags consists of several stages: mixing and drying of raw materials, where primary and secondary polypropylene granules are mixed with dyes and necessary additives.

Calcium carbonate is often used, which gives the package a white color and the desired rigidity. The finished mixture is then fed into a polypropylene extruder with a flat slit nozzle and heated to 260 °C; making and winding a flat filament, where the heated mixture passes through the nozzle as a thin film. After cooling, it is cut into flat threads of the required thickness, tempered, pulled and wound on coils; fabric production, where the round loom is adjusted to the required parameters - the fabric density, thread interweaving and fabric width are set. The resulting polypropylene sleeve for the manufacture of bags is wound on packages (bobbins); cutting, where the finished polypropylene cloth is cut into blanks by hot cutting. The cut-off line can be smooth or wavy. Polypropylene thread is produced by extrusion of polypropylene granules. When fed to the extruder, the pellets are heated to 260 °C and squeezed out through the channel of the extruder head, turning into a thin film, which is fed to the cutting mechanism, which cuts it into strips – polypropylene threads. A coiling machine is installed in the same line with the extruder, which allows you to optimize the production process as much as possible. The resulting threads are wound on metal spools and sent to the weaving shop. Bobbins with polypropylene threads are installed in a round loom and, using a shuttle mechanism, a polypropylene cloth is woven.

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round looms are used in production. At this stage, the loom is adjusted to the exact parameters of the polypropylene bag, the required width is determined, as well as the presence of special anti-slip threads, thanks to which the polypropylene bags stacked on top of each other do not part during transportation or storage. The cloth woven from polypropylene threads is called a polypropylene sleeve. It is wound on large spools suitable for transport and storage, and filled into a machine for cutting and stitching the bottom seam. Having cut off, using a hot knife, a fragment of a given length from the polypropylene sleeve, the machine sews the seam with a strong thread. The resulting polypropylene bags are automatically folded into bales of 500 or 1000 pieces. Ready-made polypropylene bags are pressed for easy storage and transportation, wrapped with polypropylene fabric and covered with polypropylene tape. At the final stage, a seal is applied to the polypropylene bag, if necessary. The flexographic machine allows you to apply a logo or other information, getting a high-quality print.

Today, the main methods of processing polypropylene are extrusion-industrial injection molding, mechanical pressing and thermoforming. Studying the characteristics of polypropylene and plastics, as well as the scope of their application, allows you to choose the necessary raw materials for the production of almost any product for technical and household purposes. Basic properties of polypropylene. It is a nonpolar polymer from the polyolefin class. Externally, polypropylene in the granule looks like a white substance. Polypropylene granules are intended for the production of technical and household products, films, as well as for lamination of bags with polypropylene. The plastic crusher crushes any plastic waste into a crumb suitable for loading into the extruder.

For the production of polypropylene filaments, the following equipment is used - a dispenser and an extruder. Purpose of the dispenser-polypropylene granules are mixed, prepared and dried. Production of polypropylene thread and winding it on coils is carried out on the unit for extruding polypropylene thread (extruder) and on the unit for winding polypropylene thread on coils. An extruder for the production of flat filaments. Produces a wide polymer film, performs longitudinal cutting of the film into filaments, stretching them to the required thickness and stabilization. A four-hole circular loom binds the web in a sleeve of a given diameter and rolls it into a roll. Features of the four-sided circular loom: number of shuttles-4; method of feeding weft and main polypropylene yarns-negatively braking; type of weaving – plain; withdrawal and winding of fabric-negatively braking; adjustment of the size of weaving according to the width of the bag fabric - changing the ring diameter; machine drive with frequency control; use of narrow (in the form of flat belts) threads of different quality, including 100% plastic reinforced narrow threads; automatic machine stop when the warp or weft threads break.

Features of the bag fabric lamination extruder: suspended shear extruder; machine drive with frequency control; polypropylene web thickness within 0.018 - 0.08 mm; water forced cooling; material release roller-automatically adjustable; performs one-time one-sided or two-sided application of components on bag fabric; materials-polypropylene fabrics, polyethylene film, paints, etc. paper and plastics.

Features of the bag fabric color printer: maximum 4 colors; winding by tension tightening type; automatic correction of deformation; two workstations for collecting and releasing materials; opening and closing of the roller is air-hydraulic; separate warm air drying; you can set the print quantity from 1 to 4, automatic closing after printing is completed; alert signal release by square footage; manual and automatic control of the printing roller; one-sided or two-sided printing can be performed.

Features of automatic bag fabric cutting machines: cuts the bag and sews the bottom; automatically performs hot cutting and sewing of the bottom with fabric; touch screen control of the servo motor drive and bag length; no accretion on the bag seams after hot cutting; automatic reading of the number of bags and their folding; pneumatic stacking of a set number of bags. The hydraulic press packer for finished bags compresses the finished bags into tight bales for easy transport and space-saving storage.

Thus, we have developed a technology for the production of bags and bag fabrics, a technological process for processing and preparing raw materials for weaving, selected and justified equipment and their features for the production of bags and bag fabrics.

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Rezyume: Maqolada polipropilen qoplar ishlab chiqarish, xususan, qop va qop gazlamalar ishlab chiqarish texnologiyasi, to'qimachilik uchun xomashyoni qayta ishlash va tayyorlash texnologik jarayoni ishlab chiqilgan, qop va qop ishlab chiqarish uskunolari va ularning xususiyatlari yoritilgan. matolar tanlangan va oqlangan.

Резюме: В статье приведены производство полипропиленовых мешков, в частности разработана технология производства мешков и мешковых тканей, технологический процесс переработки и подготовки сырья к ткачеству, подобраны и обоснованы оборудования и их особенности для изготовления мешков и мешковых тканей.

Kalit so'zlar: ip, halqa, tanda, gazlama, sinish, qop.

Ключевые слова: пряжа, основа, уток, ткань, обрыв, мешок.

UNEARTHING POTENTIAL. EXPLORING THE PROSPECTS OF MINING

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Summary: Mining, the extraction of valuable minerals or other geological materials from the earth, has been an integral part of human civilization for millennia. From the dawn of civilization to the modern age, mining has played a pivotal role in shaping economies, societies, and the very landscape of our planet. Despite its long history, the prospects of mining continue to evolve, driven by technological advancements, environmental concerns, and shifting market dynamics.

Key words: *Technological Innovation, Resource Demand, Modern Mining, Circular Economy*

A Historical Perspective

The history of mining is as old as human civilization itself. Early civilizations such as the Egyptians, Greeks, and Romans engaged in mining activities to extract precious metals like gold, silver, and copper for currency, jewelry, and ceremonial objects. These ancient miners developed rudimentary techniques such as surface mining and underground tunnels to access mineral deposits.

During the Industrial Revolution, mining underwent a significant transformation with the invention of steam engines and other mechanical innovations. This era saw the rise of large-scale mining operations, particularly in coal and iron ore, to fuel the burgeoning industries of the 19th century.

Modern Mining

Today, mining is a highly sophisticated industry that employs advanced technologies such as remote sensing, GPS tracking, and automated machinery to locate, extract, and process minerals more efficiently and safely. The scope of mining has also expanded beyond traditional metals to include minerals essential for modern technologies, such as lithium for batteries and rare earth elements for electronics.

The globalization of markets has further fueled the demand for minerals, driven by rapid urbanization, industrialization, and the proliferation of consumer electronics. Developing countries with rich mineral deposits have seen mining become a cornerstone of their economies, providing employment opportunities and significant revenue through exports.

Challenges and Opportunities

However, the mining industry also faces several challenges that threaten its sustainability and social license to operate. Environmental concerns, including habitat destruction, water pollution, and greenhouse gas emissions, have led to increased scrutiny and regulatory pressure on mining companies to adopt more sustainable practices.

Furthermore, the social impact of mining, particularly on indigenous communities and local populations, has raised questions about land rights, displacement, and fair compensation. Human rights abuses, labor exploitation, and conflicts over resource ownership have tarnished the reputation of the industry in some regions. **(1- Figure)**



(1- Figure)

Nevertheless, the prospects of mining remain promising, driven by several factors:

1. **Technological Innovation:** Continued advancements in mining technology, such as autonomous vehicles, drones, and advanced sensors, promise to enhance safety, efficiency, and environmental performance.



(2- Figure)

2. **Resource Demand:** The growing demand for minerals, driven by the transition to renewable energy, electric vehicles, and digital technologies, presents lucrative opportunities for mining companies.

3. **Circular Economy:** The shift towards a circular economy, where materials are reused, recycled, and repurposed, could reduce the need for primary mineral extraction while creating new markets for secondary raw materials.

4. **Responsible Mining Practices:** Increasing pressure from consumers, investors, and regulators is prompting mining companies to adopt more responsible practices, including ethical sourcing, community engagement, and environmental stewardship.

Conclusion

Mining, with its rich history and complex dynamics, continues to shape our world in profound ways. While facing challenges related to environmental sustainability, social responsibility, and technological disruption, the industry also holds immense potential to drive economic growth, technological innovation, and social development.

As we navigate the future of mining, it is imperative to strike a balance between harnessing the earth's resources for human progress and safeguarding the planet and its inhabitants for future generations. By embracing innovation, fostering collaboration, and upholding ethical standards, the mining industry can realize its full potential as a force for positive change in the global economy.

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Rezyume: Yerdan qimmatbaho foydali qazilmalar yoki boshqa geologik materiallarni qazib olish ming yillar davomida insoniyat tsivilizatsiyasining ajralmas qismi bo'lib kelgan. Tsivilizatsiya paydo bo'lganidan to hozirgi davrgacha kon sanoati iqtisodiyotlar, jamiyatlar va sayyoramiz landshaftini shakllantirishda hal qiluvchi rol o'ynadi. O'zining uzoq tarixiga qaramay, texnologik taraqqiyot, atrof-muhit muammolari va o'zgaruvchan bozor dinamikasi asosida konchilikning istiqbollari rivojlanishda davom etmoqda.

Резюме: Горное дело, добыча ценных полезных ископаемых или других геологических материалов из земли, на протяжении тысячелетий было неотъемлемой частью человеческой цивилизации. С зарождения цивилизации до современности горнодобывающая промышленность играла ключевую роль в формировании экономики, общества и самого ландшафта нашей планеты. Несмотря на свою долгую историю, перспективы горнодобывающей промышленности продолжают развиваться, чему способствуют технологические достижения, экологические проблемы и меняющаяся динамика рынка.

Kalit so'zlari: Texnologik innovatsiyalar, resurslarga talab, zamonaviy konchilik, aylanma iqtisodiyot

Ключевые слова: Технологические инновации, спрос на ресурсы, современная горнодобывающая промышленность, циркулярная экономика

NAVIGATING THE DEPTHS. A CLOSER LOOK AT MINING TRANSPORT VEHICLES

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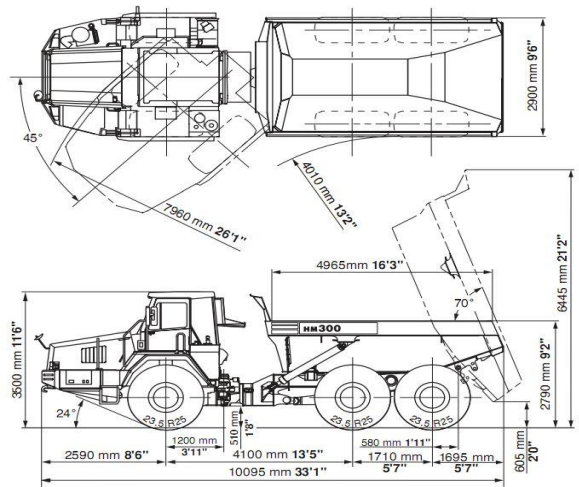
Summary: In the world of mining, where rugged terrain and formidable depths pose constant challenges, efficient transportation is paramount. Mining transport vehicles, often overlooked but integral to the industry, serve as the lifeline connecting mines to processing facilities and beyond. From hauling raw materials to ferrying personnel, these specialized machines play a vital role in ensuring the smooth operation of mining endeavors worldwide.

Keywords: *Autonomous Operation, Electric Propulsion, Data Analytics and Telematics*

The Backbone of Mining Operations

Mining transport vehicles encompass a diverse range of machines tailored to meet specific needs within the industry. From massive haul trucks to nimble utility vehicles, each serves a unique purpose, collectively forming the backbone of mining operations. Let's delve into some of the most common types:

1. Haul Trucks: These colossal behemoths dominate the landscape of large-scale mining operations. Capable of carrying hundreds of tons of material in a single load, haul trucks are the workhorses of open-pit mines. Their sheer size and power make them indispensable for efficiently transporting extracted ore and waste rock from the mining face to designated dumping areas.



1- Figure:Haul Trucks

2.Dump Trucks: Similar to haul trucks but often smaller in size, dump trucks are versatile vehicles used for transporting various materials within mining sites. Their ability to unload rapidly, either by tilting the entire bed or employing hydraulic systems, makes them ideal for quick turnaround times, essential for maintaining productivity.

3.Utility Vehicles: While haul and dump trucks handle the heavy lifting, utility vehicles cater to a myriad of essential tasks within mining operations. From transporting personnel and equipment underground to facilitating maintenance and repair work, these agile vehicles are indispensable for keeping mines running smoothly.

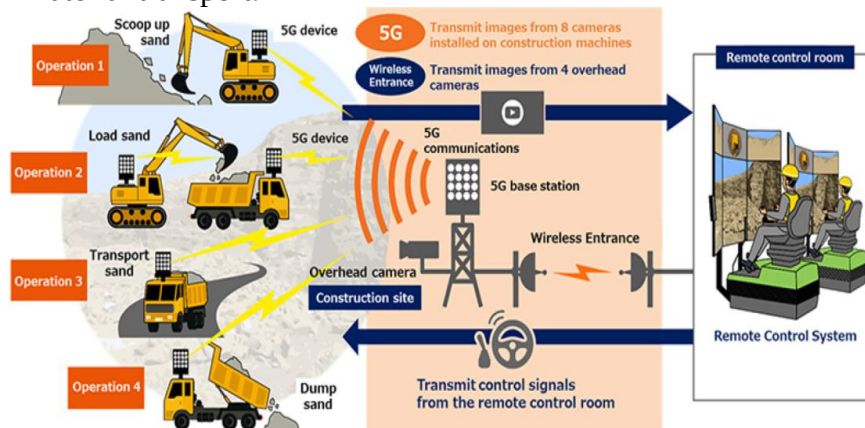
4.Shuttle Cars: Specifically designed for underground mining operations, shuttle cars transport mined coal or ore from the production face to conveyors or loading points. Their compact size and maneuverability allow them to navigate through narrow tunnels, enabling efficient extraction in confined spaces.



2- Figure: Shuttle Cars
Innovations Driving Efficiency

Advancements in technology have revolutionized the design and functionality of mining transport vehicles, enhancing efficiency, safety, and sustainability across the industry. Here are some notable innovations driving this transformation:

1. Autonomous Operation: The integration of autonomous technology has enabled mining companies to optimize fleet management and improve safety by reducing the need for human operators in hazardous environments. Autonomous haulage systems (AHS) have become increasingly prevalent, particularly in large-scale open-pit mines, where they offer greater precision and efficiency in material transport.



3- Figure: Autonomous Operation

2. Electric Propulsion: In response to growing environmental concerns and the need to reduce carbon emissions, many mining transport vehicles are transitioning from traditional diesel engines to electric propulsion systems. Electric-powered haul trucks and utility vehicles not only offer lower operating costs but also contribute to a greener, more sustainable mining industry.

3. Data Analytics and Telematics: The integration of data analytics and telematics technology allows mining companies to gather real-time insights into vehicle performance, fuel consumption, and maintenance needs. By harnessing this data, operators can optimize routes, minimize downtime, and proactively address maintenance issues, ultimately improving operational efficiency and reducing costs.

Challenges and Future Outlook

While mining transport vehicles have undoubtedly evolved to meet the demands of modern mining operations, significant challenges persist. The harsh operating conditions, remote locations, and ever-increasing demand for efficiency pose ongoing hurdles for manufacturers and operators alike. Additionally, concerns regarding safety, environmental impact, and the sustainability of mining practices continue to shape the future of the industry.

Looking ahead, innovation will remain key to overcoming these challenges and driving further improvements in mining transport technology. From the development of more efficient

propulsion systems to the integration of advanced automation and connectivity solutions, the future promises exciting possibilities for the evolution of mining transport vehicles.

Conclusion

Mining transport vehicles represent the unsung heroes of the mining industry, enabling the efficient extraction, transportation, and processing of valuable resources essential to modern society. As technology continues to advance and industry priorities evolve, these specialized machines will play an increasingly pivotal role in shaping the future of mining worldwide.

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Rezyume: *Tog'li erlar va ulkan chuqurliklar doimiy qiyinchiliklar tug'diradigan kon sanoati dunyosida samarali transport muhim ahamiyatga ega. Ko'pincha e'tibordan chetda qoladigan, ammo sanoatning ajralmas qismi bo'lgan tog'-kon transport vositalari konlarni qayta ishlash korxonalari va undan tashqarida bog'laydigan qutqaruv liniyasi bo'lib xizmat qiladi. Ushbu ixtisoslashtirilgan mashinalar xom ashyoni tashishdan tortib, xodimlarni parom tashishgacha, butun dunyo bo'ylab tog'-kon ishlarining uzluksiz ishlashini ta'minlashda muhim rol o'ynaydi.*

Резюме: *В мире горнодобывающей промышленности, где пересеченная местность и огромные глубины создают постоянные проблемы, эффективная транспортировка имеет первостепенное значение. Горнодобывающие транспортные средства, о которых часто забывают, но которые являются неотъемлемой частью отрасли, служат связующим звеном, соединяющим шахты с перерабатывающими предприятиями и за их пределами. От перевозки сырья до перевозки персонала — эти специализированные машины играют жизненно важную роль в обеспечении бесперебойной работы горнодобывающих предприятий по всему миру.*

Kalit so'zlari: *Avtonom ishlash, elektr quvvati, ma'lumotlarni tahlil qilish va telematika*

Ключевое слово: *Автономная работа, Электродвижение, анализ данных и телематика*

THE USE OF DOUBLE-GLAZED WINDOWS IN MULTI-STOREY BUILDINGS IN A SHARPLY CONTINENTAL CLIMATE

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Summary: *The article analyzes the design solutions of double-layer double-glazed windows and their properties, their suitability for climatic conditions, negative and positive effects on the building. The structure of a double-glazed window is explained, what materials are consistently used, how many chambers are used to obtain the optimal solution, the properties of double-glazed windows and what designs should be used to maintain the microclimate in the room at the same level.*

Keywords: *double glass, hot climate, plastic, construction, low emission coatings.*

INTRODUCTION.

Double-glazed windows are an interesting solution for the external climate-resistant shell of a building. Maximum use of glass in building structures is considered convenient and energy saving. All over the world, especially in multi-storey buildings, such high technologies are used. Some of them are famous buildings, such as Commerzbank in Frankfurt am Main (Germany, 1997), City Hall in London (UK, 2002), Manitoba Hydro Place in Winnipeg (Canada, 2009), One Angel Square in Manchester (Great Britain, 2013), Novatek in Moscow (Russia, 2011) National Bank in Tashkent (Uzbekistan, 1991).

This technique is mainly found in high-premium buildings, usually due to the high investment costs and difficulties in implementing such projects. Buildings with double glass facades are equipped with high-tech smart systems and operate without mechanical ventilation or cooling and have little ultraviolet radiation transmission. The construction of the facade is based on the multilayer principle - the creation of several shells and the use of certain physical and aesthetic properties of its individual layer.

The main material here is glass, which provides the necessary finishing of the building with its aesthetic and physical characteristics and performs the necessary functions of facing structures.

A glass unit is known [1] containing at least two sheets of optically transparent material, separated by a spacer frame and sealed around the perimeter with a sealant; light sources of one or more colors are attached to at least one or more of these elements of the glass unit, and all light sources are connected to a power supply through the control unit, while a glow area is created on at least one of the sheets of the glass unit. The disadvantage of this double-glazed window is the complexity of installation, significant costs for repairing the device, due, for example, to the failure of light sources, then the double-glazed window must be completely disassembled and depressurized, therefore it is not durable and therefore reliable, powerful light sources can lead to dangerous overheating of the elements glass unit, insufficient level of glass unit tightness, inability to ensure broadcasting of prepared video files, narrow range of use of the product.

A double-glazed window [2] is also known, containing glass elements glued together, characterized in that, in order to improve heat, sound and insulation properties and increase strength. It is made of three elements, the middle of which has a flat shape, and the two outer ones are trough-shaped.

A heat-saving double-glazed window [3], it is made in the form of a heat-insulated outer wall made of double glazing, in particular for windows or building facades. It contains an outer panel and an inner panel, with low-emission optical coatings applied to their surfaces, parallel to each other and forming a space. At the same time, it is equipped with a gas-dynamic device in the form of flow vortex generators, consisting of barrier panels installed at an angle to the outer panel in the middle part of the window and to the facade of the building.

The problem is solved by using double-layer double-glazed windows to reduce heat loss. The advantage of double-layer double-glazed windows reduces the entry of dust and noise into the interior. A frame is inserted between the two windows to hold the windows, moisture-absorbing material is used inside the frame to keep the air in the chamber dry, and sealant is placed under the frame to prevent moisture from penetrating. Low-emissivity coatings are used inside the external windows, which prevent the loss of warm air. In addition, to install windows on large facades, a structure made of 6 carbon polyvinyl chloride (PVC) profiles should be used and air valves should be installed on the sides of the profiles for natural ventilation of the internal climate of buildings.

The double-layer double-glazed window is illustrated by drawings, where in FIG. 1 shows the inventive double-glazed window; Fig. 2-section A-A, in Fig. 3- section B-B.

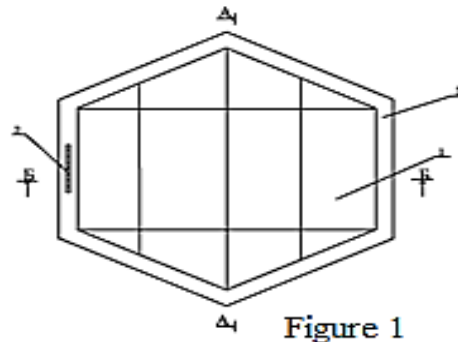


Figure 1

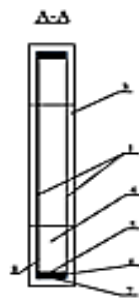


Figure 2

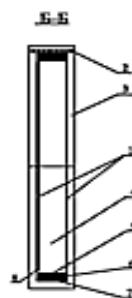


Figure 3

Windows-Glass unit works as follows.

The double-glazed window has two-layer windows 1, an air valve 2 is placed on the outer profiles, a polyvinyl chloride (PVC) profile (crossbar) 3 holds the window structure, a chamber between two windows 4, spacer frames 5 separate the glass and form the frame of the glass unit, a desiccant 6 dries the air in the chambers, sealant 7 does not let moisture in from the outside, low-emission coatings 8 are used inside the external window. The thickness of the glass is 6 mm, the width of the gap between the glasses (chambers) is 10 cm.

To prevent the formation of condensation on the surface of the glass in the internal space, only small holes are left open. The air valves of the external façade are first set to an intermediate position and then closed completely when the wind increases to ensure comfort. If the wind reaches hurricane force, the air valves will open again to relieve the static load.

The heat transfer coefficient of single-layer glass is 5.6 W/m²K, double-layer glass is 2.8 W/m²K and a three-layer double-glazed window with a low emissivity is 0.7 W/m²K. This heat is 7 times greater than that of an insulated wall (0.1 W/m²K).

CONCLUSIONS

The offered glass unit contains plastic on the window composition. When installing glass on large surfaces of buildings, polyvinyl chloride (PVC) profiles are used to strengthen the structure.

These solutions will be in hexagonal shape. Double-glazed windows in high-rise buildings reduce dynamic pressure in strong winds. The design of the double-glazed window allows you to open the windows to the desired width; due to the low-emissivity coating on the glass, less energy is consumed and thus a solution to the problem is achieved.

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Rezyume: Maqolada ikki qavatli oynalarning konstruktiv echimlari va ularning xususiyatlari, iqlim sharoitlariga mosligi, binoga salbiy va ijobiy ta'sir ko'rsatishi analiz qilingan. Ikki qavatli oynaning tuzilishi, qanday materiallar izchil qo'llanilishi, optimal echimni olish uchun qancha kameraliy oynalar ishlatilishi, ikki qavatli oynalarning xususiyatlari va xonada mikroiklimni saqlash uchun qanday dizaynlardan foydalanish kerakligi tushuntiriladi.

Резюме: В статье анализируются конструктивные решения двухслойных стеклопакетов и их свойства, их пригодность к климатическим условиям, отрицательное и положительное влияние на здание. Объясняется устройство стеклопакета, какие материалы последовательно используются, сколько камер используется для получения оптимального решения, свойства стеклопакетов и какие конструкции следует использовать для поддержания микроклимата в помещении при том же уровне.

Kalit sozlar: kameralar, ikki qavatli oyna, issiq-iqlim, plastic, konstruksiya, past emission qoplama.

Ключевые слова: двойной стекло, жаркий климат, пластик, конструкция, низко-эмиссионные покрытия.

UDK 621.313

MATHEMATICAL MODEL AND ALGORITHM FOR OPTIMAL LOAD CONTROL OF ELECTRIC CONSUMERS OF ENERGY SYSTEMS WITH RENEWABLE ENERGY SOURCES

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Annotation: The integration of renewable energy sources (RES) into electric power systems presents unique challenges and opportunities. This article presents a mathematical model and algorithm for the optimal load control of electric consumers in systems incorporating renewable energy sources. The model aims to balance energy supply and demand dynamically, taking into account the variability and intermittency of RES. The proposed algorithm optimizes load distribution to enhance system stability and efficiency, and to minimize costs. Simulation results demonstrate the effectiveness of the model in managing load control for systems with high penetration of renewable energy.

Key words: Renewable Energy Sources, Optimal Load Control, Energy Systems, Mathematical Modeling, Algorithm, Consumer Demand, Storage Systems.

Introduction

The increasing penetration of renewable energy sources, such as solar and wind, into electric power systems necessitates advanced strategies for optimal load control. Renewable energy sources are inherently variable and unpredictable, posing challenges for maintaining the balance between electricity supply and demand. Effective load control strategies are essential to ensure system reliability, stability, and cost efficiency [1-6].

This article proposes a mathematical model and algorithm designed to optimize load control in electric systems that integrate renewable energy sources. The model considers the stochastic nature of RES and aims to enhance the overall efficiency and stability of the power system. The proposed algorithm is validated through simulations, highlighting its potential to manage load control effectively in real-world scenarios.

Mathematical Model

System Description

Consider an electric power system with multiple consumers and a mix of traditional and renewable energy sources. Let:

- $P_d(t)$: total demand at time t
- $P_r(t)$: power generated by renewable sources at time t
- $P_t(t)$: power generated by traditional sources at time t
- $P_b(t)$: power from the battery storage system at time t
- $P_c(t)$: controllable load at time t

The power balance equation at any time t is given by:

$$P_d(t) = P_r(t) + P_t(t) + P_b(t) - P_c(t)$$

Objective Function

The primary objective is to minimize the cost of electricity generation and maximize the use of renewable energy while ensuring system stability. The cost function C can be defined as:

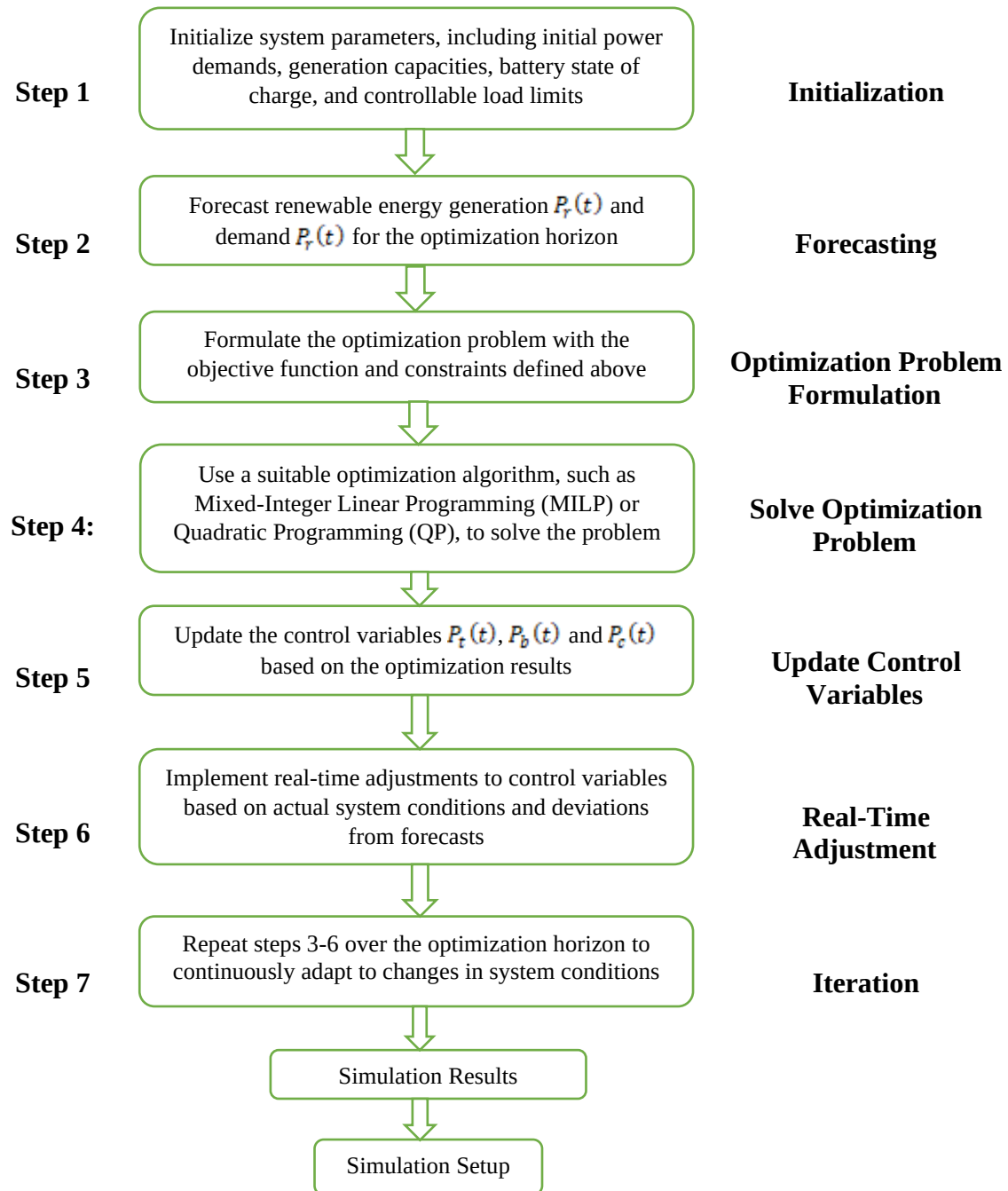
$$C = \int_0^T (C_t(P_t(t)) + C_b(P_b(t)) + C_{shed}(P_{shed}(t))) dt$$

where:

- $C_t(P_t(t))$: cost of generating power from traditional sources
- $C_b(P_b(t))$: cost associated with battery usage

- $C_{shed}(P_{shed}(t))$: cost of load shedding (if any) [7-8]

Algorithm for Optimal Load Control



A simulation was conducted using the proposed model and algorithm on a test system with the following characteristics:

- A mix of solar and wind energy sources with varying generation profiles
- Traditional power plants with fixed generation capacities
- Battery storage systems with specific charge/discharge limits
- Multiple controllable loads with different priorities and constraints

Constraints

1. Power Balance Constraint:

$$P_d(t) = P_r(t) + P_t(t) + P_b(t) - P_c(t)$$

2. Generation Limits:

$$0 \leq P_r(t) \leq P_{r,max}(t)$$

$$0 \leq P_t(t) \leq P_{t,max}$$

3. Battery Constraints:

$$P_b(t) = P_b^{in}(t) - P_b^{out}(t)$$

$$0 \leq P_b^{in}(t) \leq P_{b,max}^{in}$$

$$0 \leq P_b^{out}(t) \leq P_{b,max}^{out}$$

4. Controllable Load Constraints:

$$0 \leq P_c(t) \leq P_{c,max}$$

Results and Discussion

The simulation results demonstrate the effectiveness of the proposed model and algorithm. Key performance metrics include:

Renewable Energy Utilization: The proportion of energy demand met by renewable sources.

Cost Savings: Reduction in total generation costs compared to a baseline scenario without optimal load control.

System Stability: Maintenance of power balance and minimization of load shedding.

The following graphs and tables summarize the simulation results:

Graph: Power Generation and Demand over Time

Table 1: Summary of Key Performance Metrics [3]

Metric	Value
Renewable Energy Utilization	75 %
Cost savings	15 %
Load Shedding	0.5 % of total demand

Conclusion

The proposed mathematical model and algorithm for optimal load control in electric systems with renewable energy sources effectively manage the inherent variability and intermittency of RES. The simulation results highlight significant improvements in renewable energy utilization, cost savings, and system stability. Future work will focus on enhancing the model to incorporate additional factors such as demand response and advanced storage technologies.

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Rezyume: Qayta tiklanadigan energiya manbalarini (QTEM) elektr energetika tizimlariga integratsiyalashuvi o'ziga xos muammolar va imkoniyatlarni taqdim etadi. Ushbu maqola qayta tiklanadigan energiya manbalarini o'z ichiga olgan tizimlarda elektr iste'molchilarining yukini optimal boshqarish uchun matematik model va algoritmnini taqdim etadi. Model QTEMning

o'zgaruvchanligi va uzilishlarini hisobga olgan holda energiya taklifi va taklifini dinamik ravishda muvozanatlashga qaratilgan. Taklif etilayotgan algoritm tizim barqarorligi va samaradorligini oshirish hamda xarajatlarni minimallashtirish uchun yuk taqsimotini optimallashtiradi. Simulyatsiya natijalari qayta tiklanadigan energiyaning yuqori kirishiga ega tizimlar uchun yukni boshqarishni boshqarishda modelning samaradorligini ko'rsatadi.

Резюме: *Интеграция возобновляемых источников энергии (ВИЭ) в электроэнергетические системы представляет собой уникальные проблемы и возможности. В статье представлены математическая модель и алгоритм оптимального управления нагрузкой потребителей электроэнергии в системах с использованием возобновляемых источников энергии. Модель направлена на динамический баланс спроса и предложения энергии, принимая во внимание изменчивость и непостоянство ВИЭ. Предложенный алгоритм оптимизирует распределение нагрузки для повышения стабильности и эффективности системы, а также для минимизации затрат. Результаты моделирования демонстрируют эффективность модели в управлении нагрузкой для систем с высоким уровнем использования возобновляемых источников энергии.*

Kalit so'zlar. *Qayta tiklanadigan energiya manbalari, optimal yukni boshqarish, energiya tizimlari, matematik modellashtirish, algoritm, iste'molchi talabi, saqlash tizimlari.*

Ключевые слова. *Возобновляемые источники энергии, оптимальное управление нагрузкой, энергетические системы, математическое моделирование, алгоритм, потребительский спрос, системы хранения.*

**AUTOMATION OF THE PROCESS OF DETECTION OF HUMAN FACE
EMOTIONS IN REAL-TIME MODE**

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Summary: *This article is devoted to the research of automation of the process of identifying emotions on the human face in real time. Methods and systems for recognizing emotions on the human face are analyzed. In addition, the working process of the new software created using modern libraries and technologies of the Python programming language and the results of automatic recognition of human facial emotions using it are presented.*

Key words: *algorithms, artificial intelligence technologies, Viola-Jones and multimodal methods, Python, TensorFlow, NumPy, OpenCV.*

Currently, there is no area where information technology has not penetrated. With the rapid development of information technology, facial recognition systems are widely used in various fields, including security systems, forensic work, international level test systems for verification, identification and other such purposes.

Facial emotion recognition is a technology that analyzes facial expressions in images and videos to infer information about human emotions. Facial expressions are non-standard forms of communication that convey human emotions. Many algorithms have already been used in this field. However, the algorithms show some flaws in their performance, which means that recognition can sometimes fail due to a change in hairstyle or wearing glasses. But the algorithms show some flaws in their performance, which means that recognition can sometimes fail due to a change in hairstyle or wearing glasses.

Human face recognition is closely related to various emotions, and in recent years, researchers have primarily established that emotions can be expressed through seven basic categories: anger, joy, surprise, fear, sadness, disgust, and neutrality. It is noteworthy that mixed emotions also exist, but they are composed of various combinations of these primary emotions. During the emergence of these emotions, the muscles of the face move and significant changes occur in the image. For example, changes in the shape of wrinkles, eyebrows, eyes and other parts of the face are observed.

Automatic image identification using computers is one of the most significant directions in artificial intelligence technologies, enabling the recognition and identification of human facial features. Learning automatic emotion recognition methods creates the possibility of identifying processes dependent on a person's mood through a computer.

According to certain studies, during face-to-face interactions between two individuals, only 30% of the information is conveyed verbally, while the majority is transmitted nonverbally through facial expressions, gestures, postures, and other cues.

In negotiations and other interpersonal interactions, nonverbal communication can sometimes convey more about a person's true feelings or intentions than their words alone. Facial expressions, in particular, are powerful indicators of emotions and can influence how a message is received and interpreted by others.

Facial emotion recognition, as a field, focuses on the ability to detect and interpret these facial expressions accurately. It has applications in various areas such as human-computer interaction, psychology, and even in the development of AI and robotics to enhance their ability to understand and respond to human emotions.



Figure 1. Facial emotion recognition using signs.

Recognition methods. There are several methods of face recognition, Viola-Jones and Multimodal methods are studied and analyzed below. In addition, there are also face recognition systems such as Template Matching (TemplateMatching), Hopfield neural network methods, and Face Reader, EmoDect, Faces Security [1, 2].

Several popular systems are used to recognize human facial emotions. For example, FaceReader, EmoDetect, Faces Security, etc. However, these systems also have some shortcomings. Below we will discuss some of the shortcomings:

- wearing glasses can complicate facial emotion recognition (FER) systems, often leading to inaccurate or incomplete emotion recognition;
- in some cases, it is observed that it cannot identify faces in the profile;
- the system may not be able to recognize emotions on faces when objects are outside the typical frontal position, meaning for individuals who are turned more than 15 degrees;
- if the shadows of some objects or too much light falling on the human face can create specific difficulties in recognition, which in turn causes errors in the system;

Addressing these shortcomings and developing facial recognition systems that are more accurate and robust using new technologies based on modern programming languages is one of the pressing issues. In this regard, the use of new libraries and technologies of Python, a high-level programming language, will be more effective.

Python libraries and technologies can be used to create a variety of modern programs. For example, frameworks like Django and Flask are used for web development, libraries like Pandas and NumPy are used for data analysis, the Pygame library is used for creating various computer games, and there are also specialized libraries and technologies for different tasks in other fields. Additionally, libraries like TensorFlow, OpenCV, dlib, and face_recognition can be used to create image recognition and analysis systems and software applications [3, 4].

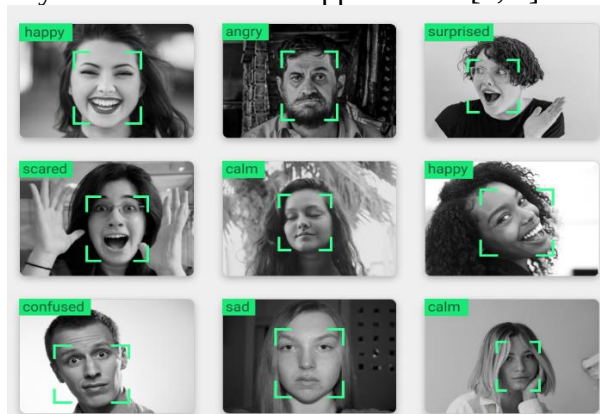


Figure 2. Results of human facial emotion recognition

Using the libraries and technologies of the above Python programming language, a program was developed to recognize the human face and identify the emotions in it [3-5]. This program is

called "Emotions", and several technologies and libraries such as TensorFlow, OpenCV and numpy were used in its creation.

TensorFlow is an open source software library developed by Google for automatic image recognition and classification.

NumPy (Numerical Python) is an open source library that uses high-level mathematical functions for working with multidimensional arrays (including matrices) in the Python programming language.

OpenCV (Open Source Computer Vision Library) is an image and video processing library used for their analysis. It is used for facial and character recognition, license plate reading, photo editing, and more.

The program only displays the emotions accurately when the human face is clearly visible. This program has 6 different emotion models, which are determined by analyzing changes in the face, wrinkles, eyebrows, eyes, and other features. For example, if the eyebrows and eyes do not change, i.e., a neutral face expression is shown, the label "Odatiy" will appear. If the person shows a surprised face expression, the label "Hayratga tushmoq" will appear. Below we can see the process of how the program works.

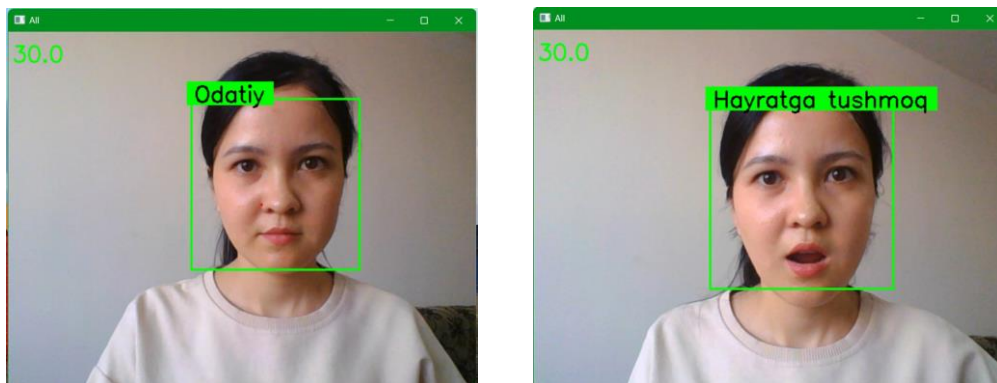


Figure 3. The process of identifying emotions through the program ("Normal" and "Surprised")

Through the program, we can express the following emotions depending on the changing state of the eyebrows and mouth on the human face. In this case, if the changes in the person's face indicate a state of happiness, the text "Xursand" is displayed on the screen, if it indicates a state of sadness, the text "Xafa" is displayed on the screen.

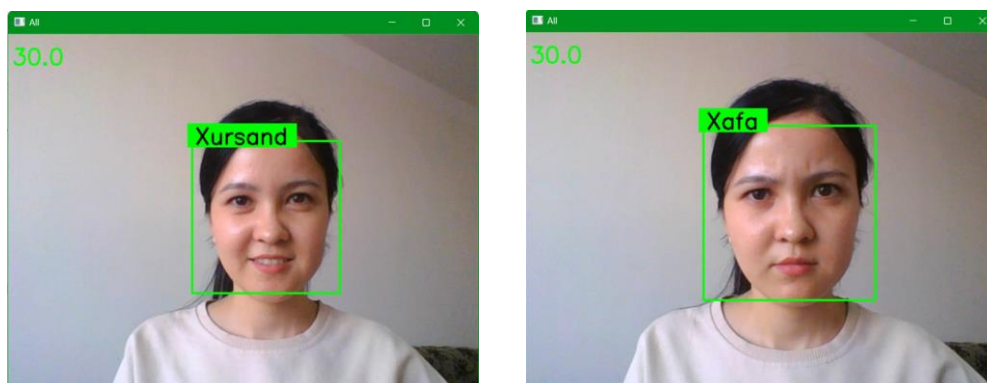


Figure 4. The process of identifying emotions through the program ("Happy" and "Sad")

If, when the program starts, the human face is not fully visible or is not fully reflected on the computer's webcam, the message "Inson yuzi aniqroq korinmayapti" will be displayed. We can see this process in Figure 5.

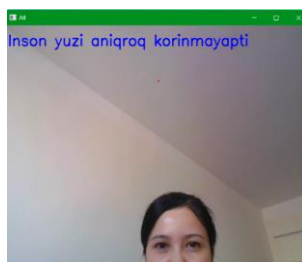


Figure 5. Case when the human face is not fully visible

The goal of creating the program was to develop a new system based on modern recognition technologies to identify emotions on the human face in non-standard situations. Through this, we have developed a new system that automates the process of identifying emotions on the human face in real time [5].

Conclusion. Today, facial recognition technologies can be used to identify individuals, enabling better monitoring and surveillance in high-security areas such as airports, government facilities, and banks.

Facial recognition technologies create opportunities such as recognizing a person and viewing this person's information, preventing theft in stores and other places, identifying regular customers, monitoring the working hours of employees in offices and controlling access and exit. Therefore, it is necessary to create various software and systems using modern programming languages in order to automate many processes in our life and at the same time to ease the lifestyle of people.

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Rezyume: Mazkur maqola real vaqt rejimida inson yuzidagi his-tuyg'ularni aniqlash jarayonini avtomatlashtirish masalalarini tadqiq etishga bag'ishlangan. Bunda inson yuzidagi hissiyotlarni tanib olish usullari va tizimlari tahlil etilgan. Bundan tashqari, Python dasturlash tilining zamonaviy kutubxonalari va texnologiyalaridan foydalangan holda yaratilgan yangi dasturiy ta'minotning ishlash jarayoni va undan foydalanib inson yuzidagi his-tuyg'ularni avtomat ravishda aniqlash natijalari keltirilgan.

Резюме: Данная статья посвящена исследованию автоматизации процесса распознавания эмоций на лице человека в режиме реального времени. Анализируются методы и системы распознавания эмоций на лице человека. Кроме того, представлен процесс работы нового программного обеспечения, созданного с использованием современных библиотек и технологий языка программирования Python, и результаты автоматического распознавания эмоций по лицу человека с его помощью.

Kalit so'zlar: algoritmlar, sun'iy intellekt texnologiyalari, Viola-Jons va Multimodal usullari, Python, TensorFlow, NumPy, OpenCV.

Ключевые слова: алгоритмы, технологии искусственного интеллекта, Виолы-Джонса и мультимодальные методы, Python, TensorFlow, NumPy, OpenCV.

UDC: 94:902(575.171).

DISTRIBUTION OF THE FIRST IRON TOOLS IN ANCIENT KHOREZM

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Summary: *The article studied on the basis of archaeological materials, the period of distribution of iron objects in the monuments of ancient Khorezm. The distribution of iron objects in ancient Khorezm was influenced by political and migration processes as a significant factor. The period of the spread of iron products in the Kuyisay culture of the early Iron Age, which dates back to VII BC. The ancient Khorezmians began to produce iron items in the Kozalikir settlement from the 6th century BC. The spread of blacksmithing products, on the monuments of ancient Khorezm from the 7th century BC which continued to 3rd – 2nd centuries BC.*

Keywords. *Southern Aral Sea region, Khorezm, Iron Age, Kuyisay culture, Sak tribes, Kozalikir culture, iron products, blacksmith craft.*

The next stage of the development of metallurgy and metallurgical industries is associated with the emergence of iron metallurgy. The transition to the Iron Age or the use of iron began almost simultaneously in different parts of the world at the beginning of the 1st millennium BC.

In particular, in Northern and Central Iran and beyond the Caucasus, iron objects were found at the end of the 1st millennium BC. It has been known in the complexes of the North Caucasus since the VIII century BC, in particular, it is recorded in the monuments of Novocherkas [15, B. 52]. As a result, there will be ample opportunities for the improvement of labour tools, which are the impetus for any development, and human activity will expand even more.

In some scientific literature on Central Asia, it is recognized that the beginning of the Iron Age corresponds to the beginning of the 1st millennium BC, while in other literature, it is determined by the 7th-6th centuries. Such information shows the need to clarify the ideas about the distribution of iron products and the emergence of blacksmithing craft in the historical regions of Central Asia.

According to N.G. Gorbunova, among the nomadic tribes of Central Asia, iron objects appeared only at the end of the 7th century BC. [6, B.105].

In the work of L.T. Yablonsky, the spread of iron objects in the monuments of the Begazin group of Central Kazakhstan is indicated in the 8th – 7th centuries BC, along the banks of the Lower Syrdarya in the 7th – 6th centuries BC [15, B.51].

M.V. Masson stated that in the south of Turkmenistan, one of the first centres of civilization in Central Asia, the first iron products were recorded no later than the 7th century BC, and iron products were widespread in the region in the 7th - 6th centuries BC [9, B.51- 52]. At the same time, it is worth recalling V.M. Masson's additional opinion in this regard: "... the beginning of the Iron Age in the south of Central Asia can be dated to the third quarter of the 1st millennium BC, but it was a general dating" [10, B. 108].

According to V.M. Masson's scientific hypothesis, iron entered Central Asia through Iran [10, B. 96, 108]. The basis for this is the fragments of iron products in the monument of Anov in South Turkmenistan and traces of production of iron products recorded in the archaic monuments of Dehistan [10, B. 96]. Many researchers consider the origin of "painted" pottery complexes (Anov-4, Yaz-1, etc.) in South Central Asia to be related to Eastern Iran in the Early Iron Age.

Surprisingly, regardless of the presence of later iron objects, some researchers began to connect the synchronous monuments or complexes of the Murgob oasis, South Uzbekistan and the Tashkent oasis with the early Iron Age. This applies primarily to the Yaztepa population space, which includes the Yaz 1 period complex, which is the main reference point for identifying the

monuments of the "painted" pottery culture in the neighbouring regions. This list also includes the monuments of Kuchuktepa (Kuchuktepa-2 complex period) and Burguluk.

A. Sagidullaev stated that in the 10th – 8th centuries BC, as in previous periods, metal weapons were made of bronze in many monuments of Central Asia [12, B. 229-234]. According to the scientist, this is the stage of transition from the Late Bronze Age to the Early Iron Age. In many scientific works that published the results of research on this period, this period is interpreted as the late Bronze Age, and sometimes the early Iron Age.

Of course, it is difficult to interpret iron metallurgy and blacksmithing as the period in which the iron metallurgy and blacksmith industry was created, based on the first iron findings recorded from the monuments of this period.

In the literature related to the South coastal areas of Aral, there are cases of confusing the Late Bronze Age with the Early Iron Age. In particular, there are opinions that the Amirabad culture, which belongs to the Late Bronze Age, is related to the Early Iron Age [8, B. 16].

It is known that no iron objects have been recorded from the monuments of the Amirabad culture. Analyzing the publications of the materials of the monuments of the Early Iron Age, it is impossible not to note the existing "uncertainty" of the date of the beginning of this period.

During the analysis and systematization of the archaeological materials collected by D. Rozanov until the 80s of the 20th century, he clearly shows the distribution of iron objects in Central Asia, Anov-IV, Yaztepa-I in Southern Turmanistan, Chust culture in Fergana is determined by the third quarter of the 1st millennium BC in the monuments of Dalvirzintepa, the 6th – 4th centuries BC in the Afroasiyob fortress in Sogd territory, the 6th – 5th centuries BC in Northern Bactria, and the 6th – 5th centuries BC in the monuments of Khorezm [11, B. 38-45].

In the conclusions of the researcher, the beginning of the Iron Age in Central Asia is shown as the third quarter of the 1st millennium BC. However, the distribution of iron objects in Khorezm monuments is determined by the 6th – 5th centuries BC [11, B. 44].

Today, the monuments and settlements of the Early Iron Age are somewhat more studied than in earlier periods. In this regard, new materials have appeared, which, along with the previous ones, allow a somewhat more accurate approach to the study of the time of the appearance of iron in Central Asia, including the Saka tribes of the Archipelago and Khorezm.

L. Yablonsky noted that the distribution of iron in the Sak tribes of Central Asia was very late [15, B.57]: 1) in the burial mounds of the Sakas in the Eastern Pamirs, 6th – 4th centuries BC; 2) 7th – 5th centuries BC in the Southern Tagisken monument on the banks of the Lower Syrdarya; 3) 7th – 5th centuries BC at the Uygarak monument on the banks of the Lower Syrdarya; 4) 1000 years BC in the monuments of Sakas in the foothills of Altai; 5) 1000 years BC in the tombs of Sakas in Northern Kazakhstan ; 6) 1000 BC in the monuments of the series of Saka tombs in Tien-Shan and Aloy; 7) Iron objects from the year 1000 BC are scattered in the tombs of Sakas in Eastern Kazakhstan .

The distribution of iron objects in the Saka tribes of the coastal areas of Aral is dated to the 7th – 6th centuries BC [5, B.72-72; 15, B.52]. The Sak tribes along the Lower Syrdarya served as the main mediators in the introduction of iron objects to Khorezm.

During the Early Iron Age, the steppe tribes of the coastal areas of Aral, as well as in Khorezm, were not left out of technological discoveries in the fields of metallurgy and metalworking professions.

Kuyisay culture is understood as the first Iron Age culture in Khorezm. In the Early Iron Age, the settlement of the Sak cattle herding tribes in the Sarikamish region increased considerably [4, B. 42-48]. At that time, the lands of the left bank of the Lower Amudarya along Sarikamish and Dovdon were intensively exploited by the population.

During the initial archaeological research, a small knife with a handle and a flat back was found in the Kuyisay-2 site belonging to the Kuyisay culture [4, B. 44, 46]. Jewelry and bronze (copper) craft industries have developed in this settlement. Iron slag was also found on top of the monument.

The chronological period of the settlement of Kuyisay-2 was defined by the researcher as the boundaries of the 7th - first half and 6th centuries BC.

Stone, wood, bone, bronze objects and iron objects are also found in the tombs of Sakar-chaga belonging to Kuyisay culture [15, B. 34. Fig. 7, 8; 19, 12-13; 21, 7-8, 10]. Iron and bronze knives are among the tools of work and everyday life. Also, two iron objects of uncertain shape were found in the graves of Sakar-chaga 6 group [15, B. 34. Fig. 15, 8; 16, 1]. One of them is an arc-shaped iron object with a round cross-section.

The high date of pottery products in the tombs of Sakar-chaga corresponds to the first half of the 7th and 6th centuries BC.

The metal knives in the tombs of Kuyisay culture are the same according to the method of making, but they are divided into bronze and iron according to their material [15, B. 32-33]. Bronze knives are twice as common as iron knives in graves. Among the iron knives, small specimens with a length of up to 7 cm prevail. Also, knives up to 20 cm long were found in Sakar-chaga 6 and other graves.

Archaeological evidence shows that both bronze and iron objects were used in Kuyisay culture in the 7th century BC, but the use of bronze objects was still preferred in the society of that time. Among the metal finds in the monuments of this period, bronze bow arrowheads, jewelry, and horse equipment make up the majority. In that period, the first steps in the use and production of iron tools began. It should be said that although the inhabitants of the Kuyisay culture were familiar with iron products in the 7th century BC, it testifies to the fact that iron tools and weapons were not widespread among them yet. S.B. Bolelov divides the history of the early Iron Age of Khorezm into two stages [1, B. 71-78]:

The first stage, between the end of the 8th century BC and the beginning of the 7th century BC, as a result of the migration of the first Saks from the banks of the Lower Syrdarya to the Sarikamish region, is shown as the period of formation of the Kuyisay culture.

However, the distribution of iron objects in Khorezm at the end of the 8th century BC was not shown by the author on the basis of archaeological materials. The second stage is explained in connection with the formation of the Kozalikir culture and the emergence of the pottery centre in Khumbuztepa (Southern Khorezm) at the end of the 7th century BC.

According to the conclusions of S.B. Bolelov, the activity of bronze casting and blacksmithing in the Kozalikir fortress occurred at a slightly earlier stage, at the end of the 7th century - the beginning of the 6th century BC, and may be synchronous with the sites of Kuyisay [2, B. 7]. In the Eastern part of the castle, the remains of a large workshop producing iron products were found, iron slag was collected in a large area [13, B. 26-27]. Artifacts in the monument testify to the intensive activity of the forge. Also, ceramic noses were found in the area which were used in the process of air-breathing in forging furnaces [14, B. 149].

In addition, the group of hand-made pottery in Kozalikir attracts attention, where fragments of small, thick-walled, semicircular and cylindrical vessels are found, which apparently can be interpreted as small crucibles [3, B.81-82].

The Iron Age materials of the Kozalikir culture can be conditionally divided into two stages: The first Kozalikir stage is the period from the 7th – 6th centuries BC to the beginning of the 5th century. The late Dingilja period lasts from the second half of the 5th century BC and the beginning of the 4th century to the 2nd century BC.

When we analyzed the archaeological materials in Khorezm in the 3rd – 2nd centuries BC, the development cycle of the Iron Age bronze arrows ended, and they were completely replaced by iron arrows [7, B. 328]. From that period, the production of protective armour from iron began and became widespread. In conclusion, it can be noted that political and migration processes influenced the spread of iron objects in Khorezm as an important factor. The distribution dynamics of iron and steel products can be conditionally divided into two stages. In the first stage, in the 7th century BC, the distribution of early iron objects begins in the monuments of the Kuyisay culture.

In the second stage, the Khorasmian migration to Khorezm (7th - 6th centuries BC) and during the Achaemenids period, tools made of iron spread widely. In the society of Khorezm, the production of various products and tools from iron led to fundamental changes in economic life.

Therefore, the artifacts and their comparative analysis determine the distribution process of the first iron objects in the monuments of Khorezm by the 7th century BC. According to the archaeological materials of Kozalikir, it can be said that the first steps were taken in the process of specialization in the field of blacksmithing in the 6th – 5th centuries BC. The products of the blacksmith craft took the form of goods and began to be produced for the market. The distribution of iron in the economic and military sectors in Khorezm started from the 7th century BC and continued until the 3rd – 2nd centuries BC.

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Rezyume: *Rezyume: Maqolada arxeologik materiallar asosida qadimgi Xorazm yodgorliklarida temir buyumlarning tarqalish davri o'rganilgan. Qadimgi Xorazmda temir buyumlarning tarqalishiga siyosiy va migratsiya jarayonlari muhim omil sifatida ta'sir ko'rsatgan. Ilk temir davri Quvisoy madaniyatida temir buyumlarning tarqalish davri miloddan avvalgi VII asrga to'g'ri keladi. Qadimgi xorazmliklar Kozalikir manzilgohida miloddan avvalgi VI asrdan boshlab temir buyumlar ishlab chiqara boshlaganlar. Qadimgi Xorazm yodgorliklarida temirchilik mahsulotlarining tarqalishi miloddan avvalgi 7-asrdan miloddan avvalgi 3-2-asrlarga qadar davom etgan.*

Резюме: *В статье на основе археологических материалов изучен период распространения железных предметов в памятниках древнего Хорезма. На распространение железных предметов в древнем Хорезме существенное влияние оказали политические и миграционные процессы. Период распространения железных изделий в Куйсайской культуре раннего железного века, датируемый VII веком до н.э. Древние хорезмийцы начали производить железные изделия на поселении Козаликир с VI века до нашей эры. Распространение кузнечного дела на памятниках древнего Хорезма с VII века до нашей эры, продолжавшееся до III-II веков до нашей эры.*

Kalit so'zlar: *Janubiy Orolbo'yi, Xorazm, temir davri, Quvisoy madaniyati, sak qabilalari, Kozalikir madaniyati, temirdan yasalgan buyumlar, temirchilik hunarmandchiligi.*

Ключевые слова : *Южное Приаралье, Хорезм, железный век, куйсайская культура, сакские племена, козаликирская культура, изделия из железа, кузнечное ремесло.*

FORMATION OF PRACTICAL AND THEORETICAL EXPERIENCES OF FOREIGN MUSIC PEDAGOGY IN THE MINDS OF STUDENTS OF HIGHER EDUCATION MUSIC EDUCATION

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Summary: *This article is devoted to the topic of music pedagogy abroad, in which the pedagogical views of Eduardas Costo Balsis are analyzed. The article is based on the pedagogical practice of Pierre Elvridus van Houve and the main aspects of music education, and at the same time, the uniqueness of the teaching methodology of the music system of Carl Heinrich Maria Orff and Zoltán Kodály is highlighted.*

Keywords: *Music education, musical pedagogy, foreign pedagogy, scientific research, music theory, music system, music lessons, music school, foreign experience, new generation, music literacy, musical knowledge.*

Introduction. Musical-pedagogical complexes, as well as the sum of practical and theoretical experiences of Russian musicians, were primarily related to the process of organizing musical instruments. Around the middle of the 19th century, Russian musical culture was divided into two distinct branches: urban and peasant culture.

Together, this pair of musical cultures became a kind of foundation, on the basis of which a new school of Russian music was formed. The 60s of the 19th century were distinguished by the fact that various Russian public figures and musicians spent a lot of work on organizing musical education for children on a rational basis. Their logic, according to them, is based on the fact that every child has a certain inclination towards musical activities. Their goal was to create a single musical pedagogic system that would be equally suitable for amateurs and future professionals. It was planned to pay attention to national musical traditions as part of the ongoing educational process. It is also important to note that the talk was always about a collective form of music education, but never about the development of individual teaching methods. At the beginning of 1917, the reform of Russian music education was almost ready[2].

However, as a result of the revolution that took place, the whole process experienced a significant "setback". The views of the representatives of the new government on culture were fundamentally different from the views of the reformers, who assumed its existence in the form of enlightenment. He was involved in club work and his vector was aimed at something in the middle[4].

The main part. Common school music education in China has existed for only a hundred years. Today, it is even more important, because the problem of forming a well-rounded person in modern China is very acute. It is necessary to neutralize the urban and technocratic consequences of the scientific and technological revolution in a country with a population of about one and a half billion people, which has made huge achievements in the economic, industrial, scientific and technical spheres in the last twenty years. deformation of human personality. Aesthetic education at school, introducing its basis to musical culture should become one of the important factors in solving this problem in general education. In one of the most difficult periods in the history of the country, saturated with global cataclysms, school music education has become a state system characterized by both significant achievements and serious shortcomings. In light of what has happened since the 90s. educational reforms, the idea of school music education in China, its history and current situation are becoming especially relevant. Looking back, assessing achievements and challenges is a prerequisite for successful change[6].

At the moment, China's comprehensive school is the center of attention of the country's scientists. In recent years, many works have been devoted to him, covering music education from different angles. Among the authors who studied the history of modern general music education in

the context of Chinese high school, first of all, it is necessary to name Wang Bingjiao, Wang Yuhe, Wang Yun Yi, Zhang Xiang, Zhang Yuan, Zou.

Valuable materials for presenting the development characteristics of school music education and its current status are the documents of state bodies - decisions, decisions, educational and prospective plans, etc., and statistical data collection of Zhang Xiang, Zhang Yuan, Yaa Siyuan and Chen Hong[1].

E. Jacques-Dalcroze, C. Orff, Z. Kodali, B. Trichkova, K. Dalfrati, S. Suzuki, D.B. Kabalevsky, E.B. Abdullina, N.A. Terentyeva, L.G. Dmitrieva, V. V. Kiryushina, D.E. Ogorodnova, P.S. Volkova and others. In addition to the authors' own works, the works of Chinese researchers Mu Peiyan, Mu Li, Lin Nenze, Liu Pei, Li Danna, Ying Aiqing, Cao Li, Zuo Linglin, Can Zuoji and others are devoted to public achievements. music pedagogy abroad. Various aspects of school music education theory and methodology are discussed in the works of Guo Shenjian, Ding Gan, Zia Singfeng, Zou Aiming, Ma Dongfeng, Lu Mingde, Ma Da and other researchers [7].

The object of study of this work was the development of general school music education in China from its inception to the present.



Pedagogical views of Eduardas Costo Balsis. Currently, in the theory and practice of music education, there are different approaches to the interpretation of the term "Types of musical activities of students in music lessons".

According to the Lithuanian teacher-composer **Eduardas Kosto Balsys**[12] (lit. Eduardas Balsys; December 20, 1919, Nikolaev - November 3, 1984, Druskininkai) - Lithuanian composer, teacher, public figure), musical education, upbringing and development are the most important for school needs. a good answer, if it is based on a whole set of more or less equal activities, defined in an appropriate, clearly coherent system of activities, closely related to the common content and uniform methodology[5].

Eduardas Costo Balsis suggests the following 5 types of activities to consider in music lessons in secondary (IV - VIII) grades:

- listening to music;
- singing by ear (tune);
- Solfeggio;
- rhythmic education;
- playing musical instruments (music performance).

All links serve a general purpose in their own way; developing an ear for music, teaching to sing, if possible, to play music on elementary instruments, teaching to listen and perceive music, aesthetic education of children through music. The mentioned sections create a single system of music education and upbringing. But, in addition, each of them has its own goals, its own subsystems. In order not to violate the principle of periodicity, it is not recommended to skip any of the above links in the musical activity of this system.

Eduardas Kosto Balsis recommends to follow all the general pedagogical principles of education and training when organizing the pedagogical process in music lessons. Among the specific principles of this system, the most characteristic is complexity, that is, in the pedagogical process, all analyzed types of activities are combined into one common complex. Complexity is reflected in the creation of the entire curriculum, the distribution of learning material by topic and in each lesson. In a complex lesson, all its elements are closely related to each other and, if possible, combined. Another important and unique principle of organizing the pedagogical process in music lessons is the relationship between different types of activities[3].

Among the most important principles, we should note the balance between the main links of musical activity; ideological (loyalty to a certain integrated system of ideas and the corresponding social, moral and aesthetic ideal; consistent loyalty to them in theory and practice); artistry (according to the laws of art - dramaturgy, emotional and artistic means); accessibility (it

corresponds to the age of the educational material, individual characteristics and the level of training of the student); Pedagogical usefulness (fit for purpose); consistency (it is assumed that the teacher's presentation of educational material is brought to the level of consistency in the minds of students, so that knowledge is not only given to students in a certain sequence, but they are interrelated); contact with life; diversity; reproducibility.

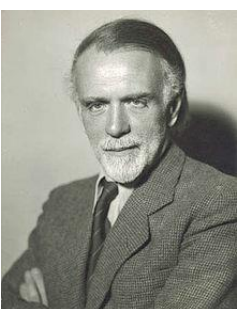
Working based on the principles listed here will ensure an optimal balance between singing, listening and playing music throughout the learning process.



Pedagogical practice of Pierre Elvridus van Houve. Pierre Elvridus van Houve[11] (Terneuzen, January 12, 1920 - Delft, June 25, 2009) was a Dutch musician and music teacher of Zeeland-Flemish origin. From 1946 he lived and worked in Delft as an educator and Roman Catholic church musician at the now-defunct St. Hippolytus Church (director of the Delft Municipal Music School from 1960 until his retirement in 1982) teacher, conductor and public figure. Before becoming the director of a music school, he traveled around Europe and got to know the pedagogical methods and systems of music education in other countries.



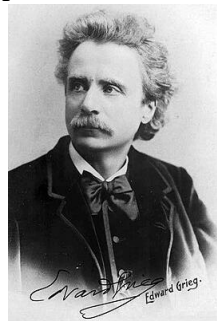
First of all, he got acquainted with the system of German composer and music teacher **K. Orff**[9] and Hungarian pedagogue, musicologist, linguist **Z. Kodaly**[10]. Over time, he was able to combine the two systems, but not blindly imitate them, but took the best and brightest from them. According to Pierre Elvridus van Houve, the music teacher has no moral right to exclude from the world of music children who do not belong to him. The teacher must give the child the opportunity to express himself, but for this he must learn a lot himself, get into the child's heart, the key to the child's psychology.



Pierre Elvridus van Houve's music system teaching methodology is unique. In general secondary schools, music lessons are conducted by music school teachers. Employees constantly play with all children without exception: they clap their hands, sing, accompany themselves with bells and tambourines, play Orff instruments and perform plays. In addition, the teacher should know what such a game teaches, what children learn by playing it. If a child plays and stands out among his peers with musical abilities, parents are advised to send him to a music school. Here the child begins to learn to play an instrument. Some children continue to progress, others stay in one of the ensembles for a

long time. Some people quit playing music altogether. But it doesn't matter, because music schools in the Netherlands do not aim at professional education for children, we are talking about playing music for pleasure, and the professional direction of music lessons remains a personal matter for students and their parents. It all depends on the ability of the teacher to find the appropriate form of group participation for each child.

After several years of work, Pierre Elvridus van Houve based on his experience published a textbook entitled *Playing with Music*, as well as a children's book *Listening to Music*, and a series of notes showing his development. children's musicality - from the simplest exercises to music performance that requires a much higher level of musical performance.



In the field of listening to music, Pierre Elvridus van Houve also looked for a way to help him to arouse the interest of children. Along with other forms of music listening, the following system is used. In line with the children's symphony concert schedule, city school teachers talk about, for example, composer **Edvard Grieg**[13] and his chamber symphonic suite "**Peer Gynt**[14]", then teach the children the main themes of the suite on a tape recorder. Children come to the concert with flutes, and before the concert begins, the orchestra conductor conducts the children's orchestra, after which the symphony orchestra plays the piece in its entirety.

In the Netherlands, the method of "Games with music" is widespread; In 5 conservatories, music is taught as a course "Teaching music at school" at the faculty of music pedagogy.

Pierre Elvridus van Houve solved a problem that several generations of famous musicians struggled with. He explained the principle of interaction between two systems of solmization[8] - relative and absolute, and thus the issue of a differential approach to the development of a musical ear and the acquisition of musical literacy was resolved.

He taught children to perceive notes at the same time in two senses - when singing notes based on the syllabic (relative - Do Re Mi Fa Sol La Si Do) system, and when reading the same notes while playing the instrument, with letters (C D E F G A B C in their absolute meaning).

The main aspects of music education.

Definition: Music education is a system that integrates musical education, training and development.

The main researches within the framework of modern music education are defined as the following areas:

- to determine the possibilities of artistic pedagogy in the field of music education;
- to study the professional qualities of a teacher;
- to study the essence, achievements, types and specific features of the professional activity of a music teacher.

Music in education includes the following forms of education:

- general music education;
- additional education.

Each of the music curricula supports the process of developing in students a love and genuine interest in music as an art, and helps develop musical-auditory concepts and practical musical skills, including performance, analysis, and aural skills. In the framework of music pedagogy, general or standard principles of pedagogy exist together with specific techniques and forms of teaching.

Conclusion. It is necessary to create conditions for the development of the basics of children's musical culture from an early age. Some children are able to achieve a high level of musical development, others are perhaps more modest. It is important that children learn from early childhood to look at music not only as a means of entertainment, but also as an important phenomenon of spiritual culture. In the process of music education, the acquisition of knowledge, skills and abilities is not an end in itself, but it is important that it serves to develop musical and general abilities, to form the foundations of music and general spiritual culture.

We can conclude that the attitude of the teacher to the child, the way the teacher presents musical works and games are important in music education of both schoolchildren and preschool children. I hope that children will have a richer and more complete perception of music itself after being introduced to the world of musical instruments. Perhaps some of them want to know about other genres that have not been paid attention to yet. Or someone wants to learn how to play by themselves. In my opinion, there is one important aspect in the musical systems of the considered musician-teachers (Eduardas Costo Balsis and Pierre Elvridus van Houve): it is determined by the role of the student, his active position.

This activity is based on a unique practical way of mastering music - creating one's own musical structures, playing in an orchestra, singing together in group music and theater performances, mastering sheet music and musical literacy. A common aspect of these systems is that children of preschool and elementary school age first master the art of music, and then choose their own path in music, including in the professional field, during adolescence.

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14. [https://ru.wikipedia.org/wiki/Пер_Гюнт_\(музыка\)](https://ru.wikipedia.org/wiki/Пер_Гюнт_(музыка))

Rezyume: *Ushbu maqola Xorijda musiqa pedagogikasi mavzusiga bag'ishlangan bo'lib, unda Eduardas Kosto Balsisning pedagogik qarashlari taxlil qilingan. Maqola negizida Per Elvridus van Hauvening pedagogik amaliyoti va Musiqa ta'limining asosiy jihatlari qaratilgan bo'lib, shu bilan birgalikda Karl Geynrix Mariya Orff hamda Zoltán Kodálining musiqa tizimi o'qitish metodikasi o'ziga xosligi yoritib berilgan.*

Резюме: *Данная статья посвящена теме музыкальной педагогики за рубежом, в которой анализируются педагогические взгляды Эдуардаса Косто Балсиса. Статья основана на педагогической практике Пьера Эльвридуса ван Уве и основных аспектах музыкального образования и в то же время подчеркивает уникальность методики преподавания музыкальной системы Карла Генриха Марии Орфа и Золтана Кодая.*

Kalit so'zlar: *Musiqa ta'lim, musiqiy pedagogika, xorijiy pedagogika, ilmiy izlanish, musiqa nazariyasi, musiqa tizimi, musiqa darslari, musiqa maktabi, xorijiy tajriba, yangi avlod, musiqa savodi, musiqiy bilim.*

Ключевые слова: *Музыкальное образование, музыкальная педагогика, зарубежная педагогика, научные исследования, теория музыки, музыкальная система, уроки музыки, музыкальная школа, зарубежный опыт, новое поколение, музыкальная грамотность, музыкальные знания.*

CREATE A DATABASE AND ADD-ONS FOR THE "E-NAZORAT" ONLINE TEST TESTING INFORMATION SYSTEM

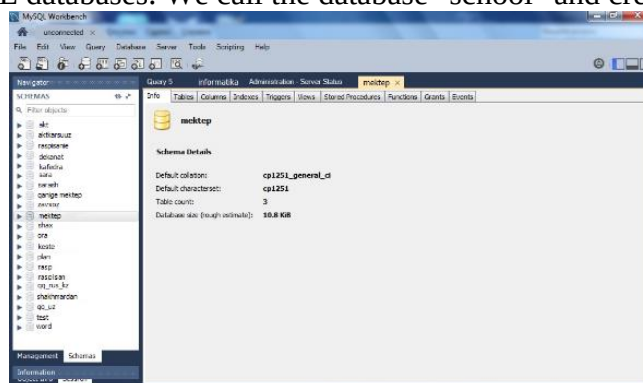
Qidirbayeva J.K¹, Orazbayev Sh.I².

¹Karakalpak State University named after Berdakh, ²Minister of Agriculture of the Republic of Karakalpakstan

Summary: The purpose of creating an information system for online testing «e-nazorat» for secondary and secondary special educational institutions is to create an online testing system for school teachers and students, and the main goal is to improve the quality of education and training in secondary and secondary special educational institutions using ICT.

Key words: MySQL, system, «e-nazorat», quality, school, control.

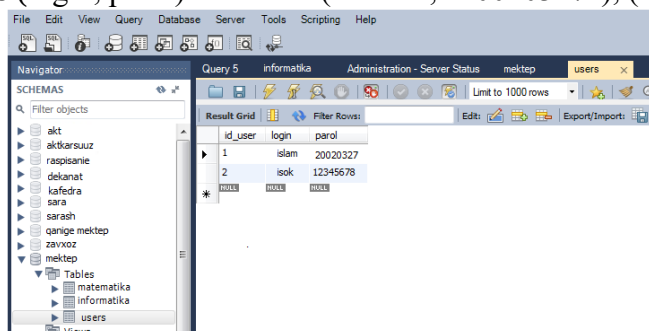
For the "e-nazorat" information system, first of all, we need a database, and for this we will create a database and necessary tables for our system using the MySQL Workbench program, which facilitates work with MySQL databases. We call the database "school" and create it:



Now we create a table of users that stores information about users of the system, and we enter the information:

```
CREATE TABLE users (id_user INT AUTO_INCREMENT PRIMARY KEY, login  
vARCHAR (255) NOT NULL, parol vARCHAR (255) NOT NULL);
```

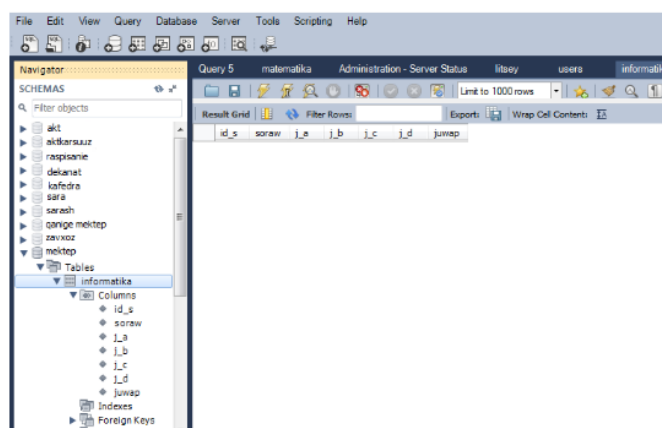
```
INSERT INTO users (login, parol) vALUES ("islam", "20020327"), ("isok", "12345678");
```



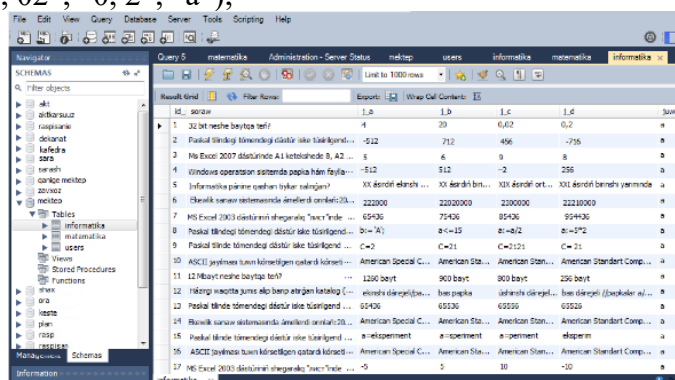
In this case, the field "id_user" is the identification number of users and it is not repeated within this field. Here, each user is given a separate login and password, and this login and password is asked to log in to the system.

Now we will introduce online testing in electronic form, that is, through a local network or the Internet. For this, we will create a database of tests in advance, that is, separate tables for each subject will be created and information will be provided.

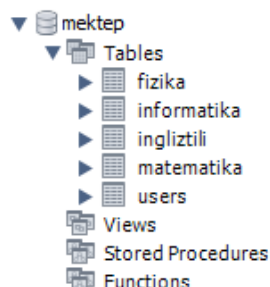
```
CREATE TABLE informatika (id_s INT AUTO_INCREMENT PRIMARY KEY, soraw  
MEDIUMTEXT NOT NULL, j_a MEDIUMTEXT NOT NULL, j_b MEDIUMTEXT NOT NULL,  
j_c MEDIUMTEXT NOT NULL, j_d MEDIUMTEXT NOT NULL, juwap vARCHAR (2) NOT  
NULL);
```



INSERT INTO informatika (soraw, j_a, j_b, j_c, j_d, juwap) vALUES (“32 bıyt neshe baytqa teń?”, “2”, “20”, “0, 02”, “0, 2”, “a”);



Thus, we created mathematics, computer science, physics and a set of tests in English, mathematics, computer science, physics, English-language tables and filled them with information.

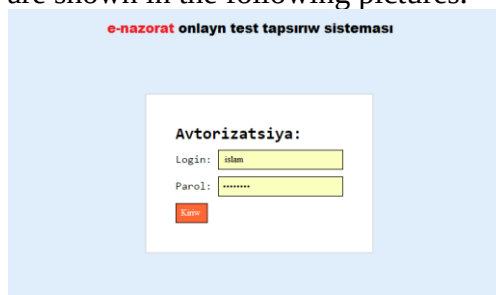


We use the php language to write the system's program code, and Java scripts for checks and convenience when entering data.

To display the information in the system and fill out the forms, we divide the program codes into modules. and check the login and password and write a separate code in the program that gives access to the system, etc.

About the patterns of the structured system

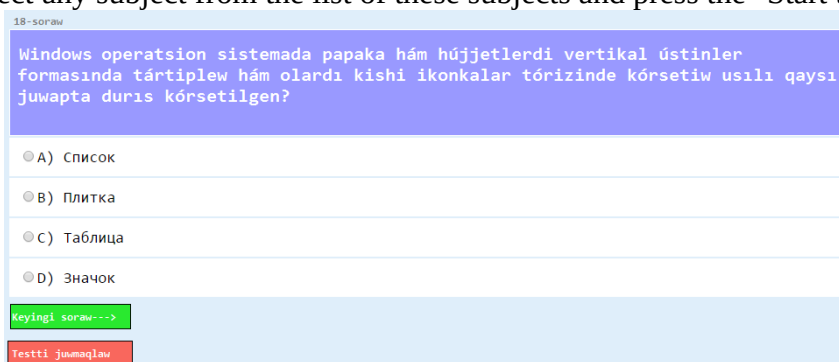
The patterns of the system are shown in the following pictures.



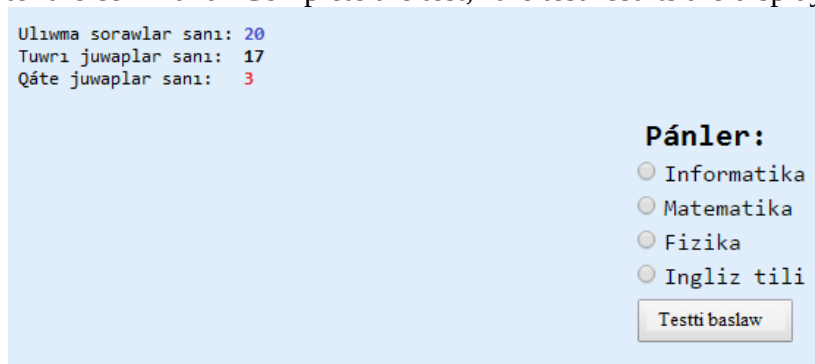
The entry window of the online test information system "e-nazorat." Each user logs in with their own special password and login. The system identifies the user by this password and login. If the user is identified in the system, a list of subjects to be tested will be provided.



Then, select any subject from the list of these subjects and press the "Start the test" button.



After the command "Complete the test," the test results are displayed.



Conclusion.

At a time when the current era of technological development is continuing, the experience of teachers and teachers corresponding to world standards is very necessary.

Therefore, we need to start learning, inventing and applying various methods and technologies in teaching our subject from now on.

The issues of creating an online test-taking information system «e-nazorat» for secondary and secondary special educational institutions in this graduate qualification work were studied and the following conclusions were drawn.

- ❖ The work processes of employees of secondary and secondary special educational institutions related to education and upbringing were studied.
- ❖ In the information system, users were taken into account and its project was created.
- ❖ When creating an information system, the MySQL database and the PHP script language, which are convenient for web programming, were selected and studied in them.
- ❖ Based on this, a database of tests for schools was created and a user-friendly interface was developed.

The created online test «e-nazorat» for secondary and secondary special educational institutions is aimed at schools based on the information system, which can be used by pre-school students and teachers in conducting various control activities. In addition, it will be appropriate to develop the system in the future and conduct work on distance learning, creating a school electronic library.

In conclusion, in order to develop, improve and introduce electronic educational resources into the educational process to increase the effectiveness of the educational system based on the effective use of information and communication technologies, computer prints, virtual laboratories, creative works, virtual trips and multimedia programs are being created, which will allow the use of multimedia and Internet teaching technologies, as well as improve the quality of the lesson.

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- 3.Yu.V.Romanets., P.A.Timofeev., Z.F.Shangin. Protection of information in computer systems and networks. Moscow Radio and Communications-2001;
- 4.<http://www.my.gov.uz>;
- 5.<http://www.php.ru>;
- 6.<http://www.intuit.ru>

Rezyume: *Ushbu maqolada o'rta maxsus ta'lim muassasalari uchun "e-nazorat" onlayn test topshirish axborot tizimini yaratish. Maktab o'qutuvchilari va o'quvchilari uchun onlayn test tizimini yaratib qulayliklarni ohirishdan iborat bo'lib, asosiy maqsad o'rta va o'rta maxsus ta'lim tashkilotlarida AKT dan foydalangan holda ta'lim-tarbiya sifatini oshirishdan iborat.*

Резюме: *В данной статье рассматривается создание информационной системы онлайн-сдачи тестов "e-nazorat" для средних специальных учебных заведений. Она заключается в создании системы онлайн-тестирования для школьных учителей, а основной целью является повышение качества образования с использованием ИКТ в организациях среднего и среднего специального образования.*

Kalit so'zlar: *MySQL, tizim, «e-nazorat», sifat, maktab, nazorat.*

Ключевые слова: *MySQL, система, «e-nazorat», качество, школа, контроль.*

ANALYSIS OF THE PROPORTION OF PROBLEMATIC LOANS IN THE LOAN PORTFOLIO

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Summary: *In this article, special attention is paid to the early identification of problematic loans, and sufficient importance is given to the scientific improvement of the methods of applying all the recommendations in banking practice.*

Key words: *Commercial banks, credit investments, problem loans, and loan portfolios.*

Currently, banking efficiency is considered to be the fastest-growing system in the economy of the Republic of Uzbekistan. However, this rapid growth poses a threat to the quality of assets (and loans) as well as banks' ability to manage credit risk. At the same time, it is relevant for commercial banks to develop methods for dealing with problematic loans. According to the President of the Republic of Uzbekistan, Shavkat Mirziyoyev, the repayment of these loans should be undertaken in collaboration with banks, businesses, companies, and organizations that are indebted, as well as regional authorities, to recover them, thus further enhancing banks' capacity [1].

Many foreign studies in the field of problematic loan management have been conducted to identify the optimal strategy for handling problematic loans. This is evident in the scientific research conducted by Western researchers such as Goering R. J., Greppet J. M., Karele G. V., Riddow T. J., and S. B. Viatt and Greaves R. Issues related to credit risk management and problematic loans in commercial banks, as well as minimization of their number, have been studied and analyzed by local researchers, including T.M. Garaliev, O.A. Tukhtaboev and K.A. Mukhamedzhanov. Based on the findings of the study conducted by D. Y. Platonov and S. Y. Zaichenko [4], an increase in the number of problematic loans may negatively impact the quality of a bank's loan portfolio and result in additional costs, reduced profits, or losses. Therefore, banks need to implement effective strategies for managing these assets to mitigate potential risks. According to A.V. Slavyansky, a researcher in the field of problematic loans (2009), a "problematic loan" is a loan in which the borrower is unable or lacks sufficient funds to meet the terms of the loan agreement to repay the debt on time and in full. O.A. Yusupova's research paper suggests that overdue payments can arise not only as a result of a client's financial difficulties but also through their negligence, as they may forget to make payments on time even when they have the necessary funds available. In a scientific article published by V.V. Mazurin [7], it was noted that delayed loans are not fully repaid on time by the current agreement. The author also noted that the term "problematic loan" is primarily associated with high financial losses for banks due to the incorrect approach of the borrower toward the loan. This situation is often accompanied by a deterioration in the financial condition of the borrower. According to the Basel Committee, a problematic loan is defined as one that may experience significant changes in the timeliness of the borrower's repayments to the bank, a substantial deterioration in the financial standing of the borrower, and a substantial reduction in the quality of the collateral or even loans with significant losses. When discussing risk, experts typically refer primarily to credit risk, which is the risk that a loan and associated interest payments will not be repaid. This type of risk is influenced by a variety of factors, including the composition of a customer base. One of the significant factors that influence the assessment of this risk is the calculation of a client's creditworthiness. To reduce credit risk and minimize the number of problematic loans, it is essential to thoroughly assess the creditworthiness of customers and employ effective risk management techniques. This creates a need for the development of procedures for managing problematic loans in commercial banks' loan portfolios and is a prerequisite for the further development of the banking system.

The development of banking services in the context of modernizing the country's economy necessitates addressing several significant issues in this area. We believe that the key challenges to the development of this sector include:

1. The gap between the proportion of overdue loans to the amount of investment and the regulatory requirements established in international banking practices. As of January 1st, 2006, the proportion of overdue loans from commercial banks in the republic to the total volume of loan investments exceeded 10%. The permissible level of this indicator under international regulatory requirements is 8%.

The high percentage of overdue loans can be explained by the following factors:

- insufficiency of highly liquid collateral objects on the balance sheets of the bank's clients;
- low level of efficiency of investment projects;
- the underdevelopment of the system for assessing the solvency of customers to repay a loan;
- the inconsistency of business plans offered to banks by customers, the commercial unreasonableness of indicators in the plan

2. In line with international banking standards, the proportion of term and savings deposits in the overall deposit base of commercial banks should exceed 60%. However, in the case of major commercial banks in the country, this current indicator falls below 50%.

3. The low level of monetization in our republic. As of December 31st, 2006, the level of monetization in the Republic of Uzbekistan was 15%. In developing economies, this figure should ideally be at least 40%.

4. Low proportion of the total volume of financing sources for investments of commercial banks.

5. The existence of factors that adversely affect the revenue base of commercial banks in our country.

These factors include:

- free maintenance of budgetary associations by commercial banks

A significant portion of the monetary support associated with the cash execution of the government budget is allocated to commercial banks.

Overdue and problematic loans from commercial banks not only adversely affect the quality of their assets, but also increase the risk of loan defaults.

The factors contributing to the occurrence of problematic loan debt can be categorized into:

- Objective factors
- Subjective factors

Objective factors include:

- Negative change in the exchange rate of foreign currency;
- Natural disasters (fire, earthquake, flood, climate change);
- Political or economic changes;
- Pandemic;
- Situations not related to the debtor and the bank

At the same time, the subjective reasons themselves are divided into 2, which consist of the following:

1. Factors on the part of the debtor that may arise include, in general:

- An incorrect development of the business plan, which may be due to:
- A lack of thorough planning;
- Incomplete fulfillment of obligations;
- Fraud or other actions that circumvent the law;
- Creation of a hidden economic entity;

Factors that may arise from the bank's perspective include:

- Errors made by employees during the lending and collection process;
- Personal interests, favoritism, providing high-risk loans to affiliated persons;

- Conclusion of contracts that do not meet the interests of the bank;
- High appreciation of products (equipment) and collateral purchased on credit;
- Unjustified cancellation of the prohibition of collateral;

When dealing with problematic credit debts that have arisen, the following actions are suggested:

Establish individual monitoring and analysis of each debtor by setting up a system for working with clients.

Ensure that the main accounts of borrowers are in the O'zSQBank's system and that secondary accounts track cash flow in the current situation. Make timely demands for payment to debtors and guarantors of credit obligations. Promptly provide documents to law enforcement agencies in the event of suspected misuse of accounts payable or diversion of funds in contravention of applicable regulations.

In each recovery process, comply with the regulation of the stages of execution of executive documents of courts, executive and notary offices within the established time limits;

Let's analyze the effectiveness of methods of working with problem loans in the loan portfolio of commercial banks using the example of several banks with state participation, with a high credit rating, operating in the Republic of Uzbekistan for more than ten years. Along with the rapid growth in the volume of existing credit debt, the volume of overdue and problematic credit debt of banks today is equal to 2-3 percent, and in some cases 3-5 percent or more of the bank's loan portfolio, and the growth rate is growing.

In terms of the volume of problem loans and their share in the loan portfolio (NPL) in the Kungrad branch of O'zSQBank for debts with a close maturity, the dynamics are as follows.

- The balance of the problem debt is 8,701.0 million sums. The NPL index amounts to 4.6% of the total. The property received to cover distressed assets, as well as the dynamics of overdue installment payments and the remaining amount of property sold in installments, amounts to 98 million sums.

In 2021, a total of 53.3 billion sums were allocated for loans. Of this amount, 31.3 billion were in national currency and 22 billion in foreign currency. Out of the 25.7 billion allocated for small businesses, all funds were fully repaid within the same year.

In 2021, by the schedules, loans totaling 42.9 billion sums were repaid, of which 36.2 billion were in national currency and 6.7 billion in foreign currency. As a result of this, according to current projections, the loan portfolio will reach 197.3 billion sums by the end of 2021 (an increase of 10.4 billion, or 105%, compared to the beginning of the year). Consequently, compared to the previous year, interest income increased by 105%, amounting to 23.6 billion sums. Income-generating assets have increased by 197.3 billion sums, or 105%, this year. 21.3 billion sums in loans were repaid, 2.0 billion sums were low-interest loans and 53.3 billion sums were issued on a commercial basis, increasing the profitability of loans. Loans in foreign currency totaled 81.2 billion sums, representing 41.1% of the total, an increase of 74% from 2020, indicating a higher level of dollarization.

Today, the branch is experiencing a problem with outstanding debts in the amount of 1.3 billion sums. Out of this amount, 1,084.4 million sums are overdue payments, 23.1 million sums are undergoing legal proceedings, 257.6 million sums represent unpaid interest, and 98.3 million sums relate to property claims.

To recover these funds, contracts with customers are first concluded and work is ongoing to file claims in court for economic and civil matters against individuals who have failed to fulfill their contractual obligations. Measures on the collection and improvement of the quality of problematic loans in commercial banking institutions;

Opportunities for implementing stress testing methodologies about current loan portfolios in banks;

Development of an efficient mechanism for maintaining loan portfolio quality through a comprehensive analysis of problematic loans within the context of classification;

However, to reduce the proportion of current problem loans in the loan portfolio, consideration should be given to the following initial measures:

- Additional collateral: additional guarantees, collateral in the form of property or real estate.
- Sale of collateral.
- Repayment of loans through the sale of the borrower's assets.
- Application of sanctions against clients.
- Obtaining additional funds and financial assistance for the borrower to repay the loan.

In general, particular attention was paid to identifying problem loans in advance, with the potential for implementing all of the aforementioned proposals in banking practices, which makes it possible to enhance the effectiveness of the process for managing problem loans.

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5. Мазурин Владимир Викторович (2016).
7. В.В. Мазурин «Механизм работы с просроченной проблемной задолженностью в розничном кредитном портфеле российских банков». Вестник университета, (6), 120.

Rezyume: *Ushbu maqolada muammoli kreditlarni barvaqt aniqlashga alohida e'tibor qaratilgan bo'lib, barcha tavsiyalarni bank amaliyotida qo'llash usullarini ilmiy takomillashtirishga yetarlicha ahamiyat berilgan.*

Резюме: *В данной статье особое внимание уделяется раннему выявлению проблемных кредитов, а также достаточное значение уделяется научному совершенствованию методов применения всех рекомендаций в банковской практике.*

Kalit so'zlar: *Tijorat banklari, kredit qo'yilmalari, muammoli kreditlar va kredit portfeli.*

Ключевые слова: *коммерческие банки, кредитные вложения, проблемные кредиты и кредитные портфели.*

THE ROLE OF THE SCIENCE OF MUSIC CULTURE IN THE DEVELOPMENT OF THE MIND OF THE YOUNG GENERATION

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Summary: *This article is based on the importance of the science of music culture in the development of the consciousness of the young generation, and the article analyzes the fact that consciousness is the highest form of mental activity, the functions of imagination and its cognitive processes, and the classification of imagination processes.*

Key words: *Uzbek people, music education, music, research, pedagogical experience, creativity, purpose of teaching, compatibility, pedagogical creativity, object, music culture teacher, musical pedagogical skill, creative direction, opportunity, activity, independent work, best practice, pedagogical situation, acting art, historical development, ancient science, literature.*

Introduction.

Human education and development has been one of the most urgent problems of any society. Because the formation, development, prosperity of the society depends on the education in this society.

The inclusion of the phrase "Uzbek music" as a priority concept, representing the name of the nation, living melodies and songs, and their scientific foundations, is a sign of the times and social needs. In fact, Uzbekistan has long been a land of universal musical values: the common folk art, which has been formed over the centuries, as well as various types of folk and classical tunes and songs, epic paths, complete status complexes, live as actual traditions of Uzbek music. The scientific potential of his treatises and sheet music still inspires admiration today[4].

Although the authors of the ancient examples of our valuable musical heritage are unknown, they live in the memory of the nation in the form of a stable basis - a text. Countless songs such as "Rost", "Navo", "Ushshaq", "Feruz", "Tanovar", "Munojot" have not lost their charm over the centuries. There is no doubt that the fundamentals of melody, weight, and form of these classical works are elaborated. However, they were created as a specific musical work (classification-composition) and by some mature composer (the meaning of the word composer) [5].

Due to its high artistic and social importance, this heritage has been passed down from generation to generation and has become a national property and spiritual food. That is the life-giving power of our live musical values.

So, lack of authorship or non-writing is not a shortcoming of our musical heritage, but rather a way of life. In view of this, it is natural to use the adjectives "classic" or "classical" in relation to a large and salutary part of such works. Recently, in the musical revolution, this layer of our heritage, which has consistently become a respected custom, is being called *mutaarif* (traditional) [12].

The main part.

It is no longer an emerging concept to give classical music a measure of modernity. In addition to our above opinion, I would like to say that: in the introduction of the "Big Book of Music", Farobi specifically mentions the importance of educational traditions in the acceptance of musical works among listeners. Farobi calls the *nafs* (feelings) formed in the manner of habit and one of its beautiful forms (forms) musical and skill (art) "practical musical art". "It became clear that some foundations of the art of music come from traditional (mythological) sciences, some from natural science (physics, acoustics), some from the art of geometry (geometry), some from *adad* (arithmetic) and some are taken from applied music. However, what we (said) was taken from the foundations of tradition and theoretical knowledge, and it is more than that"[13].

Before giving information about the role of music science in the development of the consciousness of the young generation, let's learn about what consciousness is.

Consciousness is the highest form of mental activity[34]. It is only a human phenomenon. The question of consciousness, its essence, is one of the oldest problems. At first, they tried to explain consciousness within the framework of religious and mythological views. The religious explanation of consciousness is based on interpreting it as a divine phenomenon, a miracle created by God. In many religions, the human mind is described as a manifestation of the great divine mind. The roots of such views are very old. However, they still have many supporters. He who admits that the universe and man are created, believes that consciousness is also the power of creation.

The 2nd direction in explaining the nature of consciousness is to understand consciousness as a reflection of the **material**[32] world in the human brain, to interpret it in connection with the activity of the human body. At the same time, cases of distorted interpretation of the essence of consciousness appeared within the framework of such approaches, which were named the materialist direction. According to the current known as vulgar materialism, the brain produces consciousness just as the liver produces bile. This approach leads to the conclusion that consciousness is not an ideal, but a material phenomenon. Although bile can be seen, the mind cannot be seen or grasped. In fact, the history of consciousness is related to the history of the human being. Since man is both a biological and a social being, then consciousness is a product of both biological and social development. Consciousness is made up of human **thoughts**[37] and **feelings, sensations**[35], **imaginings**[36], **will and views**[30]. Self-awareness, memory, will, and speech are the main aspects of consciousness.

Intuition – is the brain's analysis of certain properties of things and events in the world. It appears on the basis of the influence of matter on the sensory organs and stimulation of the cerebral cortex. Intuition is the first stage and component of knowing the world. Forms of emotional cognition such as perception and imagination arise on the basis of sensations. Depending on the characteristics of external stimuli, all senses are divided into bodily sensations (feelings), **visual sensations**[31], **hearing sensations**[28], **olfactory sensations**[29], **taste sensations**[33] and other types. Sensation appears in physical, physiological, psychological processes. In a physical process, any object or event affects the sense organs and stimulates the corresponding sensory nerve endings. In the physiological process, the impulse is transferred to the corresponding system of central cells of the cerebral cortex through the conduction path of the nerve. In the psychological process, an analysis of the stimulus that affects us appears in the nerve impulse, and it turns into a synthesis - Sensation appears. Sensory organs are related to the activity of the large hemispheres of the brain. The sense of sight takes the leading place in the knowledge of reality in a person. Sensations can be divided into 3 depending on where they are located:

1) **extroreceptors** - these are on the surface of the body, they include the senses of sight, hearing, smell, taste, touch;

2) **interoceptors** - sensations inside our body, including sensations in the intestines, liver, and lungs;

3) **proprioceptors** are in muscles, tendons, and ligaments. All senses have their own characteristics and laws.

General laws of sensations The emergence of sensations occurs on the basis of certain laws.

Imagination – is the ability of a person to spontaneously create or deliberately construct images and ideas of objects that have not been perceived or not perceived at all in the experienced experience of the imager (for example, historical events, an assumed future, unperceived or non-existent world events, for example, a fairy tale, a myth and others' supernatural characters), the ability of a person to create and manipulate images, imaginings, ideas plays an important role in mental processes such as modeling, planning, creativity, play, memory, thinking.

In the modern conditions of education modernization all over the world, schools face the task of developing the basic competencies of schoolchildren of all ages, among them: creativity, cognitive and constructive abilities, independence in activities and the ability to self-learn[2].

Imagination - L.S. Vygotsky, V.V. According to Davydov, O.M. Dyachenko, A.I. Kirillova, E.E. Sapogova, Yu.A. Poluyanov and other researchers, it is the basis of human creativity.

The problem of developing imagination is especially relevant today, when adults are trying to quickly develop the child's intellectual abilities in order to prepare him for school. According to some psychologists, the information a child encounters in kindergarten today is becoming more and more didactic. It is dominated by educational elements rather than playful or stimulating imagination and creativity. Specific activities such as play, drawing, modeling and design are increasingly squeezed out of children's lives. All this leads to the loss of interest and motivation to study in the majority of elementary school students and causes early psychological fatigue of the child, the fragility of his psyche already in kindergarten[26].

A favorable age for the development of imagination is preschool age. According to L.S. Vygotsky's periodicity of mental development, imagination is the central new formation of preschool age. There are also ample opportunities for developing creative imagination at primary school age. Many domestic and foreign psychologists L.S. Vygotsky, A. Ya. Dudetsky, O.M. Dyachenko, G.D. Kirillova, E.E. Kravtsova, N.N. Palagina, E.M. Gasparova, N. Ya. Mikhailenko, A.G. Ruzskoy, M.K. Shcherbak, V.M. Ivina, T.V. The work of Smirnova, I.P. Rumyantseva, V.G. Kudryavtsev, V. Sinelnikova and others is devoted to the study of the development of imagination in children of preschool and primary school age.

At the same time, issues such as, for example, the development of verbal and non-verbal imagination at preschool and primary school age, the influence of various educational programs on the development of children's creative imagination, the influence of the teacher's verbal and non-verbal imagination. Children's development of these types of imagination is not fully understood[3,22].

Variational programs are mainly aimed at developing children's imagination. Some of these programs describe in sufficient detail the forms of implementation of the task of developing creativity in children. But in practice, training a child in these programs does not always contribute to his creative development. Some A.K. Dusavitsky, A.K. Markova, M.I. Lukyanova and other psychologists note the impact of the teacher's psychological qualities on the process and result of his work. These and other authors (V.I. Slobodchikov, E.I. Isaev, S.G. Kosaretsky) note the importance of a creative approach in the implementation of programming tasks and highlight the signs of a creative person.

Thus, on the one hand, the importance of developing the imagination of children of preschool and primary school age, on the other hand, the insufficient study of psychological factors affecting the development of this mental process makes our topic relevant.

Imagination is the basis of visual-figurative thinking, which allows a person to manage the situation and solve problems without direct intervention of practical actions. It helps him in many ways in life situations where practical actions are impossible or difficult or simply not acceptable. For example, in modeling abstract processes and objects.

Imagination is one of the forms of mental reflection of the world. The most traditional point of view is to describe imagination as a process (A. DA. Petrovsky and M. G. Yaroshevsky, DA. G. Kazakov and L. L. Kondratiyev, etc.). Local authors also consider this phenomenon as an ability (V. T. Kudryavtsev, L. S. Vygotsky) and as a specific activity (L. D. Stolyarenko, B. M. Teplov). Taking into account the complex functional structure of imagination, L. S. Vygotsky considered it appropriate to apply the concept of psychological system to it.

One type of creative imagination is fantasy. According to E. V. Ilyenkov, the traditional understanding of imagination reflects only its derivative function. The main thing is that it allows you to see what is there, what lies before your eyes, that is, the main task of imagination is to transform an optical phenomenon on the surface of the retina into an image of an external object.

Imagination functions. Imagination is part of the general mental process of a person and performs the following functions in the psyche:

- reflecting reality in images, as well as creating the possibility of using them, solving problems;
- regulation of emotional states;

- regulation of cognitive processes and human condition, in particular, perception, attention, memory, speech, emotions;
- formation of an internal action plan - the ability to implement them internally, to manipulate images;
- the process of planning and programming events, creating programs, evaluating their correctness, and implementing them.

Imagination and cognitive processes. Imagination is a cognitive process characterized by the processing of past experience.

The relationship between imagination and organic processes is most clearly shown in the following phenomena: ideomotor movement and psychosomatic illness. The theory and practice of psychotherapeutic effect is built on the basis of the connection between the images of a person and his organic states. Imagination is closely related to thinking. According to L. S. Vygotsky, the statement about the unity of these two processes is permissible[6,14].

Both thinking and imagining occur in a problem situation and arise from the needs of the individual. Both processes are based on leading reflection. Depending on the situation, the amount of time, the level of knowledge and their organization, the same task can be solved with the help of both imagination and thinking. The difference is that the reflection of reality, which is carried out in the process of imagination, occurs in the form of vivid images, while in the process of thinking, foresight occurs by working with concepts that allow generalization and indirect knowledge. environment. The use of one or another process depends primarily on the situation: creative imagination mainly works at the stage of cognition when the uncertainty of the situation is large enough. Thus, imagination allows you to make decisions even with incomplete knowledge.

Imagination is a part of perception, affects the creation of images of perceived objects and, at the same time, depends on perception itself. According to Ilyenkov's ideas, the main task of the imagination is to transform the optical phenomenon of scratching the surface of the retina with light waves into an image of an external object.

Classification of imagination processes.

1. According to the results:

- Reproductive imagination (the reconstruction of reality such as perception and memory)
- Effective (creative) imagination:
 - with relatively new images;
 - completely new.

2. Level of attention:

- active (optional) — includes re-creation and creative imagination;
- passive (involuntary) — involves involuntary and unpredictable imagination.

3. By type of pictures:

- clear;
- abstract.

4. According to the level of voluntary action:

- intentionally;
- involuntarily;

5. By spheres of life and activity:

- artistic - musical, literary, pictorial, etc.;
- scientific - mathematician, physicist, etc.;
- carried out in technical - inventive activity;
- in the social sphere and activities - innovative activities in these spheres;
- in the practical sphere of life and activity - in innovative activity in these spheres.
- in education, medicine, sports and other fields and activities.

Purposeful and practically oriented effective purposeful imagination is used in various technologies to solve creative and innovative problems (for example, brainstorming, free writing) in various spheres of life and activity.

Will – is the ability of a person to control his own activities and mental processes[23]. When a person performs a volitional action, he opposes his dominant needs and desires: the experience of "I must" and "I must" is characteristic of will, not the experience of "I want"[30].

All types of human activity and any work require a strong will from a person. Will appears and is acquired in work. The activity of the will in the mind is manifested in determining the goal of action, determining in advance the means and guidelines for achieving the goal, reaching a certain decision and executing this decision. The level of will in a person is seen in how he realizes the goal. In the processes of voluntary action, a person faces internal and external obstacles. Internal obstacles are characteristic of the person himself, his internal inclinations. A person's ability to overcome his inner inclinations, control himself and rule over himself is called inner will. External obstacles are found in the surrounding reality. A person's ability to overcome such external obstacles is called external will. In volitional activity, overcoming external obstacles (external will) is inextricably linked with overcoming internal obstacles (internal will).

Important qualities of the will: self-restraint, courage, determination, endurance and tolerance, principledness, independence and other willpower are determined depending on the degree to which these qualities are manifested. As long as a person overcomes the obstacle on the path of his action with conscious determination and perseverance based on high ideals, he is considered a strong-willed person. Will is inextricably linked with a person's character and plays an important role in its formation.

Modern science recognizes that consciousness is the result of a long evolution of matter. Matter, nature has always existed, and man is a product of relatively recent development of the material world. It took several million years for the development of matter and the emergence of a person who can think. Consciousness is a product of natural development, a property of matter, not of all matter, but of highly organized matter, that is, the human brain. But the presence of the brain alone is not enough for consciousness to exist. Consciousness is closely connected with the natural and social environment surrounding a person and can act under the influence of this environment.

Nowadays, electronic machines have been created that also perform complex creative processes, but they cannot replace consciousness, because consciousness is a very complex objective existence.

Education is a continuous process, which consists of systematically influencing the spiritual and physical development of a person in order to prepare him for socio-economic production relations. Therefore, educating young people and mobilizing them to strengthen our independence is an important example. In our independent republic, special attention has been paid to the issues of spirituality and culture[8,16].

It should be noted that in Uzbekistan, in order to shape the spiritual life of a person, wide opportunities are being created for music to penetrate deeper into cultural life.

In this, the organization of creative institutions such as the Center of Spirituality and Enlightenment newspaper, the complex of international cultural and educational relations, the association of composers and creative movements in society, the traditional competitions held in our country under the name of "Uzbekistan, My Country", methods of implementing cultural and educational reforms is being used. It should be noted that the Uzbek national music culture, which has an ancient and rich experience, has been developing for centuries in order to engage in educational activities. In these schools, music education was directly improved. In the activities of these schools, it is expressed that music is a means of education in the true sense of a person from birth to maturity throughout his life.

The fact that music is studied in connection with the art of speech and literature in its own way makes a great contribution to the development of the name and practice of music.

The most favorable conditions for creative self-realization of a person exist in additional education, the main functions of which are the formation and development of culture, first of all, the development of the creative potential of a person. Additional music education allows students to engage in various types of creative activities and contributes to the development of the musical and

creative potential of their personality. The issue of pedagogical conditions of creative self-realization of a person in additional music education has not been sufficiently studied in relation to educational institutions such as a pedagogical college and a music school.

In the study of additional education, in various types of educational institutions, students are considered as the main, non-compulsory, optional education. Students receive additional music education at the music school in addition to the general education at the general secondary school. Pupils (students) receive additional music education at the Pedagogical College in addition to secondary vocational education outside of school. Additional music education in college is not included in the curriculum and is not mandatory[10].

Additional music education is aimed at forming musical culture as an integral part of the general culture of a growing personality. In this process, folk music, musical folklore plays a special role as a traditional type of artistic culture, combining individuality of experience and performance, utilitarian and aesthetic values, elements of various types of folk art (syncretism), universal methods. human interaction with the outside world and local folklore, its connection with regional ethno-cultural zones (A.F. Kamaev, T. Yu. Kamaeva). The multifaceted features of folk music create favorable pedagogical conditions for the development and culture-forming functions of additional musical education, which can become an effective pedagogical tool for creative self-realization of a growing individual[19].

We will look at the scientific research of Vasiliev Mikhail Aleksandrovich based on the ideas given above.

The relevance of the research is determined by the fact that it is aimed at solving the existing objective contradictions between:

- the increasing need of the society to form a person who can express his creative potential in activities of social and personal importance during the educational process, insufficient development of the problem of creative self-awareness of the person in pedagogical researches; including reflecting the field of additional education;

- teachers' awareness of the role of additional music education as a means of creative self-realization of a person and the underdeveloped pedagogical conditions that ensure the realization of this role, as well as the functions of development and culture formation in the process of music development; musical and creative potential of students.

Thus, the problem of the research is to develop the theoretical and practical foundations of creating a system of pedagogical conditions for the organization of additional music education for the purpose of creative self-realization of the individual. This problem determined the choice of the topic of the dissertation research - "Pedagogical conditions of creative self-awareness of the individual in additional music education"[27,20].

The improvement of music education in the development of personality is definitely directly dependent on the educational methodology. Music education methodology belongs to the system as a science and has its independent place. This subject studies its laws in order to further improve the content and methods of music education methodology. The methodology of music education relies on the generalized experiences of the sciences of sophistication, musicology, physiology, and psychology in educational institutions. The methodology of music education is closely related to the disciplines of musicology. If the name of sophistication forms the basis of its methodology, it directly affects the content and methods of education[15].

The methodology for solving problems in students' singing activities is based on physiological research.

The essence of the methodology of music education is important for the young generation, where the art and culture of music is growing.

The development of methodology as a science is directly related to the improvement of education and the art of music in society.

Together with these, he puts forward the general principles of the methodology of music education. These are the principles of artistic and technical development of consciousness, these

principles are aimed at developing students' musical abilities, increasing their interest in music, and cultivating creativity. Conscious perception of a musical work helps students to discover the content of the work and gather musical experiences, enriching their spiritual world. The principle of emotional awareness of music education develops the ability to correctly evaluate the listening work through the increase of harmony[25,17]:

- their taste in music is cultivated
- the principle of artistic and technical stage requires qualified personnel for artistic and expressive performance of the work
- pays attention to students' acquisition of singing skills.
- as a result of students' formation of ideas about the principles of development of music, development of their abilities, they will learn musical concepts again.

Modern socio-cultural conditions have significantly complicated the implementation of full-fledged education today. The reason for this was a sharp change in the social situation, a change in educational priorities, an increase in the opportunity to use education and art in general for the development of a person and the formation of his best qualities. The theoretical foundations and conclusions developed by earlier researchers in this field have lost their importance to some extent, which led to the identification of new aspects and trends, as well as modern approaches to their implementation[11,18,21].

The real situation of the problem of formation of students' interest in music in the general secondary educational institution is becoming very urgent, because it has not been solved and has not been sufficiently studied. Its timely solution allows to direct the thoughts and best qualities of the student's personality to eliminate the most destructive tendencies that have manifested themselves in society today; To maintain "himself" as a highly moral and spiritually rich person; promoting self-awareness on the way to higher artistic ideals. In this regard, the rapidly developing modern society places new demands on various types of educational institutions, and this is especially observed in relation to the public school, the organization of the pedagogical process, as well as its subjects that are directly related to the educational results[9].

He recognizes that the methodology of music education depends on many factors in the process of education. People's musical culture is formed not only under the influence of school. At home, the surrounding environment, mass media, and the integrated system of social media play a big role. There are the following problems in the development of methods of pedagogy development in the development of methods of music education, including:

- musical education of methods, content testing, performance dependence;
- development of students' musical and creative abilities;
- development of musical ability and voice, age and individual characteristics of music perception;
- connection with the possibility of using musical activities in various forms in the development of students.

The tasks of the methodology include the formation and further development of the educational process in different ways, music classes, extracurricular and extracurricular activities, holidays, entertainment evenings. The methodology of music education requires the study of literature and visual arts, which are close to the science of music, in connection with history. And this serves as an important tool for effective education of students in all aspects[7].

Research conducted by experts in the field of music pedagogy proves the need to approach the problem of education of interest in music more seriously, but musical interests of older preschool children have not been the subject of special scientific research. The problem of developing interest in music has not been sufficiently developed in the works directly related to older preschool children: the content of this concept has not been revealed, the pedagogical conditions for its education, forms and methods of pedagogical guidance have not been defined[1].

The results of getting acquainted with the practice of music education in preschool educational institutions and families showed that teachers and parents do not pay enough attention

to increasing children's interest in music. Parents rarely invite their children to listen to classics. Family Values Guide is fun music. Parents' vision of the child's musical development is limited to the teaching of practical skills and abilities. Practical teachers have misconceptions about the content of the concept of musical interest in preschool children and the methods of its education in older preschool children. Thus, there is a contradiction between the need to develop interest in classical music in older preschool children in the process of introducing children to the heritage of musical culture, and insufficient research on this issue[24].

Conclusion.

In order to make it easier for students to understand the topic, brief conclusions were given in the relevant part of the information. Doctoral (DSc), candidate (PhD), master's theses, and graduate theses were used to illustrate the topic, and citations were given where appropriate.

The lesson is the leading factor in the implementation of the goals and tasks of music education. Because of mass involvement of students, music science at school is distinguished from other subjects by its artistry, interest, and excitement.

Most importantly, music plays an important role in the formation of mental, moral and aesthetic qualities of children. Music stimulates the mind and sharpens the thinking. In music lessons and classes, students learn about education and our national culture and expand their level of knowledge.

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Rezyume: *Ushbu maqola Yosh avlod ongini rivojlantirishda musiqa madaniyati fanining ahamiyatiga asoslangan bo'lib, maqolada Ongning aqliy faoliyatning eng yuqori shakli ekanligi, Tasavvur funktsiyalari va uning kognitiv jarayonlari hamda Tasavvur jarayonlarining tasnifi tahlil qilinadi.*

Резюме: *В основе данной статьи лежит значение науки о музыкальной культуре в развитии сознания молодого поколения, анализируется тот факт, что сознание является высшей формой психической деятельности, функции воображения и его познавательные процессы, а также классификация процессов воображения.*

Kalit so'zlar: *O'zbek xalqi, musiqa ta'limi, musiqa, tadqiqot, pedagogik tajriba, ijodkorlik, o'qitish maqsadi, moslik, pedagogik ijod, obyekt, musiqa madaniyati o'qituvchisi, musiqiy pedagogik mahorat, ijodiy yo'nalish, imkoniyat, faoliyat, mustaqil ish, ilg'or tajriba, pedagogik vaziyat, aktyorlik san'ati, tarixiy taraqqiyot, antik fan, adabiyot.*

Ключевые слова: *Узбекский народ, музыкальное образование, музыка, исследование, педагогический опыт, творчество, цель обучения, совместимость, педагогическое творчество, объект, учитель музыкальной культуры, музыкально-педагогическое мастерство, творческое направление, возможность, деятельность, самостоятельная работа, передовой опыт, педагогическая ситуация, актерское искусство, историческое развитие, древняя наука, литература.*

**CLASSIFICATION OF THE UNITS OF THE TEMPORAL CONCEPT OF TIME IN
ENGLISH AND KARAKALPAK FAIRY TALES**

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Summary: *Time is an abstract concept. It does not depend on a person. Time is impossible to stop, reverse, and overtake. However, a human being divided it into segments, and made it subjective. For instance, one "objective" segment of time can be long or short, pleasant or hard. Subjective mark for time depends on a person's condition, his mood, the particular situation, a company and the attitudes towards time in a particular society. For example, time drags on, spend time well, hard times.*

This article tries to classify the units of the temporal concept of time. It is necessary to mention that the table used in the article is based on Karakalpak Folklore Volumes 67-76 (Nukus Ilim-2014) and "English fairy tales" (ABC-CLIO, Inc., press, Santa Barbara, California-2002) which was collected by Joseph Jacobs in 1890 and it consists of 206 pages and 43 fairy tales.

Key words: *concept, concept sphere, temporal concept of time, semantic structure, classification of temporal concept of time.*

The study of language concepts is one of the promising directions of linguistics and cognitive linguistics, which are macro aspects of the science of linguistics. Concepts are considered in cultural, linguistic, philosophical and other aspects, and their various interpretations, classifications and research methods are proposed. Along with the temporal concept "Time", the concept of space is recognized as one of the main concepts of any culture and language, because they are two forms of matter organization and an inexhaustible source from the point of view of linguistics, cultural studies, philosophy and other sciences. Researching the temporal concept of "time" from the linguistic and cultural point of view is characteristic of the science of linguistics, which actively studies the linguistic landscape of the world. It is really interesting to compare English and Karakalpak languages. In particular, English and Karakalpak languages belong to different cultural regions, English is recognized as European and Karakalpak is recognized as an Eastern culture.

We divided "English fairy tales" (ABC-CLIO, Inc., publisher, Santa Barbara, California-2002), which consists of 206 pages and 43 fairy tales collected by Joseph Jacobs in 1890, and 560 pages into 10 genres based on their meaning. We studied volumes 67-76 of Karakalpak folklore, which includes 352 tales (Nukus "Ilim" 2014). In the context of a comparative study of the units of the temporal concept of time given in the fairy tales in these two languages, we classified them into several groups. In this process, the parts of the day that flew the most attracted our attention. The purpose of this article is to classify the units of the temporal concept of time used in the above-mentioned English and Karakalpak fairy tales, and to shed light on the study of the parts of the day that make up a large part of it. If the object of our article is the classification of units of the temporal concept of time in English and Karakalpak fairy tales, its subject is English and Karakalpak fairy tales.

Literature review

The term concept was first used in 1928 by the Russian linguist Askoldov in his article. He defines the concept as "a unit that reflects the process of thinking about concepts of one kind or another." [1] Until the 80s of the last century, this term was used as a synonym for the word concept in linguistics, but today it can be observed that its meaning has expanded considerably. The concept has a twofold nature. Because, on the one hand, culture enters the mental world of a person in the form of a concept, on the other hand, a person enters culture with the help of a concept and sometimes influences it. [2]

The concept was defined by the famous Russian linguist V.A. Maslova as follows: "it is a semantic structure in which the linguistic and cultural identity is recorded and describes the owners of a certain ethno-culture in one way or another.[3]The linguist scientist N. Mahmudov in his treatise "Research of the Language System" In his article entitled "Looking for ways to perfect the study of language..." he writes that "...the concept is a meaningful mental concept related to thinking, but it is quite controversial to consider it as a phenomenon completely free from the national and cultural element." [4] Author of works on pragmalinguistics and cognitive linguistics, linguist According to Sh. Safarov, "... a person learns language and the material world in the same way and in the same direction. At the same time, the perception of the material world requires the creation of concepts about the perceived objects-events, and later this concept is formed as a mental model-concept and receives a material name.[5]

In our opinion, the concept is a multidisciplinary and multidimensional concept expressed in the mind, spirit and language of each individual and people living in a certain society, reflecting the culture of this society and serving as a tool for learning and entering into this culture.

The temporal concept of time is one of the most important and at the same time the simplest concepts. The temporal concept of time is abstract and it is formed with the help of knowledge structures preserved in people's memory for a long period of time. The development of the temporal concept of time takes different forms in different languages.

Studying the linguistic landscape of the world allows us to determine some specific aspects of the linguistic verbalization of the temporal concept of time in the cultures of different nations.

Based on the data of the analyzed scientific sources, when describing the content of the temporal concept of time, we adopted the following rules as fundamental: 1) cultural knowledge in the national worldview system is passed from generation to generation with the help of the linguistic landscape of the world; 2) the fundamental basis of the linguistic landscape of the world is the concepts that are understood as a discrete meaningful unit of the mental lexicon, reflecting objects and events of the real or ideal world, and are stored in the national memory of native speakers in a verbally determined form. They serve to convey information about the surrounding world and determine the national identity of the linguistic landscape of the world; 3) language is recognized as the easiest way to form concepts and the most convenient tool for their analysis; 4) concept representatives in the language are multi-level linguistic tools (lexical, word-forming, stylistic, grammatical), therefore pragmatic, socio-cultural, psychological, etc.; 5) conceptual analysis - by studying the representatives of the studied concept, establishing the connection of the phenomenon behind it with the knowledge of the surrounding reality and determining the content of the concept as a unit of the mental lexicon.[6]

The main part

The analysis of the temporal concept of time in English and Karakalpak fairy tales requires the classification of time units. We studied the above-mentioned fairy tales and from the results of the analysis we can say that the temporal concept of "time" is widely expressed in the Karakalpak language. The following table is a clear proof of this.

We can express the verbalization of parts of the day through many synonymous words. For example, in the Karakalpak language, such words as *tu'nde*, *tu'n jarpi awg'anda*, *tu'n awg'anda*, *tan' atqansha*, *tu'n ortası bolg'anda*, *tu'ni menen*, *yarım tu'nde*, *tu'n boyı*, *ku'n batıp*, *ımrıt jabılǵ'anda*, *gewgim jabıla*, *tu'nnin' bir mahalinde*, *yarım aqsham*, *el jatar ma'ha'l*, *jatarda*, *tu'n jarımında*, *bir tu'nnin' ishinde*, *biymezgil waqıt*, *biyma'ha'l*, *a'llema'ha'l* are defined in English as *at night*, *in the middle of the night*, *in the dead of the night*, *livelong night*, *a night's quarters* etc.

№	Time expressions	The English language	The Karakalpak language
1.	Parts of the day	51	82
2.	Units of defining long time period	34	49
3.	Units of defining short time period	48	65
4.	Units defining past time period	14	21

5.	Periods of human's lifespan	14	50
6.	Units for defining repetition time of actions	36	58
7.	Units for defining time of actions	63	37

This is the aspect that attracts attention that in the Karakalpak language there are 19 words describing the night, but in the English language there are 5 words.

Another interesting aspect is that in Karakalpak folklore, *biymezgil waqit*, *biyma'ha'l*, *a'llema'ha'l*, *biyhal waqit* which means night, very late, and time units that come with the words *ma'ha'l* and time the equivalent in English have not been found.

"*Ku'ni boyı jol ju'rip, biymezgil waqit bolıp ketti.*" [Folklore of Karakalpak, p. 9]; "*Tu'n jarısı waqtında ornınan turadı, tashwishlikten arılayın ha'm biyhal waqit dostımdı sinap qaytayın dep jolg'a tu'sedi.*", "*Aytqan so'zi minaw boldı: -Dostım, senin' biyma'ha'l kelgenin'nen u'sh narsenin' birewinen qalı bolmas dedim de, sonın' sharasın etip shıqtım.*" [Folklore of Karakalpak, Tale of Friendship, page 363]; "*-Ho-o menin' kelip dem alıp otirganim a'llema'ha'l boldı, deydi taskene qa'terja'm tu'rde.*" [Folklore of Karakalpak, page 423]. In Karakalpak tales, time is not shown in hours. Instead of it, the parts of the day are used (*azanda, tan' atıwdan, jatarda, pesin waqıtta, erte menen, yarım tu'nde, qaran'g'ida, sol mezigilde, gewgim jabıla, ku'n batıp, imirt jabıl'anda etc.*). In English fairy tales, we witnessed that time is often shown in clocks: "Very well", said the little pig, "I will be ready. What time do you mean to go? - "Oh, at six o'clock."; "Down at Merry-garden," replied the wolf, "and, if you will not deceive me I will come for you, at five o'clock tomorrow and get some apples."; "Well, the little pig bustled up the next morning at four o'clock, and went off for the apples, hoping to get back before the wolf came,..." [The story of the little three pigs. page 60.]; "-Well", says the gentleman to him, "if you can do anything, at eight o'clock in the morning I must have a great lake and some of the largest man-of-war vessels sailing before my mansion, and one of the largest vessels must fire a royal salute, and the last round must break the leg of the bed where my young daughter is sleeping..."; and others.

Summarizing the data of this work, the concept is considered to be the expression of knowledge and skills formed in the mind and psyche of a person and a certain society for a long time, and is closely related to the culture reflected in the language. The concept of time occupies an important place in the system of language and culture and allows to determine both universal and national characteristics of the studied languages. We can say that we have studied the world views of these peoples on time through the expression of the units of the temporal concept of time in the above-mentioned fairy tales. In other words, the time in English fairy tales is clear, that is, in hours, we did not use many synonymic words, most of the time units of the main day: morning, afternoon, evening were used. In Karakalpak fairy tales, on the contrary, we did not witness that the time was shown in hours. Instead, words that indicate a different time are used. It should also be mentioned that the parts of the day are given very widely in the fairy tales of Karakalpak, that is, they are expressed with many synonymic words.

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Rezyume: *Vaqt mavhum tushunchadir. Bu odamga bog'liq emas. Vaqtни to'xtatib, orqaga burib, bosib o'tib bo'lmaydi. Ammo odam uni qismlarga ajratdi, sub'ektiv qildi. Masalan, bir xil*

"ob'ektiv" vaqt davri uzoq yoki qisqa, yoqimli yoki qiyin bo'lishi mumkin. Vaqtni sub'ektiv baholash insonning holatiga, uning kayfiyatiga, vaziyatiga, kompaniyaga, ma'lum bir jamiyatdagi vaqtga munosabatiga bog'liq. Masalan: uzoq vaqt cho'zildi, vaqtni yaxshi o'tkazish, qiyin paytlar.

Ushbu maqolada ingliz va qoraqalpoq ertaklaridagi "VAQT" temporal konseptini ifodalovchi so'zlarni tasniflashga harakat qilinadi. Maqoladagi jadval Jozef Yakobs tomonidan 1890-yili yig'ilgan 206 bet 43 ertakni tashkil qiladigan "English fairy tales" (ABC-CLIO, Inc., nashriyoti, Santa Barbara, California-2002) va 560 betlik ma'nosiga qarab 10 ta janrga bo'lingan 352 ertakni o'z ichiga olgan qoraqalpoq folklori 67-76-tomlari (Nukus "Ilim" 2014) asosida tuzildi.

Резюме: *Время — абстрактное понятие. Это не зависит от человека. Время нельзя остановить, повернуть вспять и пройти мимо. Но человек разделил его на части, сделал субъективным. Например, один и тот же «объективный» период времени может быть длинным или коротким, приятным или трудным. Субъективная оценка времени зависит от состояния человека, его настроения, ситуации, компании, отношения ко времени в определенном обществе. Например: прошло много времени, хорошо провели время, прошли тяжелые времена.*

В данной статье предпринята попытка классифицировать слова, выражающие темпоральный концепт «ВРЕМЯ» в английских и каракалпакских сказках. Таблица в статье была составлена на основе «English fairy tales» (ABC-CLIO, Inc., издательство, Санта-Барбара, Калифорния-2002 г.), состоит из 206 страниц и 43 сказок, собранных Джозефом Джейкобсом в 1890 г., и 560 страниц разделены на 10 жанров по смыслу и 67-76 томов каракалпакского фольклора, включающего 352 сказки (Нукус «Илим», 2014).

Kalit sózlar: *konsept, konseptosfera, vaqt temporal konsepti, semantik tuzulishi, vaqt temporal konsepti tasnifi.*

Ключевые слова: *концепт, концептосфера, темпоральный концепт времени, семантическая структура, классификация темпорального концепта времени.*

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HYPertext IN JOURNALISM IS AS AN OBJECT OF CONTENT CREATION

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Summary: The characteristics of hypertext and the issue of its model have been studied from linguistics, information technologies, and historical perspectives, but have not been fully analyzed in journalism. We aim to distinguish it from other Internet journalism features. Hypertext is the practice of semantically linking multiple texts together.

Keywords: Hypertext, hypertextuality, algorithm, mass media, content analyse, hyper, Theodore Nelson, hyperlink, connection

"I am glad that the opportunity was created for people to check and evaluate the written message in an individual way. In front of his algorithm, the broadcasters are forced to be completely objective" [1], says Theodore Nelson, the founder of the theory of hypertext. With this phrase, the author emphasizes the most relevant functional aspect of mass media. Similarly, today hypertext has a special place in journalism, and it should be said that it is both old and new at the same time. If researchers of hypertext as a new concept associate it with the creation of the Internet, its oldness is associated with the ability of the author to give a link to anyone and quote excerpts from other people's opinions or written works. For that, we believe that it is necessary to study this term from a journalistic point of view, give its theoretical definitions, and define its structural characteristics.

Hypertext is a text displayed on a computer screen and other electronic devices (phone, tablet, etc.). It is created in hypertext Markup Language, which is a kind of electronic text. The term is derived from the English prefix "hyper" and the Greek "ὑπέρ" and means "up, over, trace". This is a process directly related to the function of setting links in the hypertext composition. 1941 Jorge Luis Borges wrote and published his short story "The Garden of Forking Paths". This material is remembered in history as a story that inspired the creation of hypertext. This is because, in the work, the author gave information about the invisible ways and their algorithms that connect the inter-text communication in space and time.



Influenced by this, Vannevar Bush wrote the article "As We may think" in 1945. There W. Bush wrote about a futuristic proto-hypertext called Memekh. It explains the Memekh system, which allows communication with each other through coded signs. However, due to flaws in the memekh algorithm, its history did not last long. However, this idea inspired Theodore Nelson and Douglass. In 1965, Theodore Nelson conducted research on texts connected by lines. Although the hypertext is not taken into the literal language, the idea of the structure and appearance of the text is thrown into the middle. After that, the reason for the emergence and success of the Internet was attributed to hypertext, which was invented by someone. The first comprehensive hypertext system for personal computers was developed by Peter J. Brown at the University of Kent in 1982. In it, two texts are interconnected and create a hyperlink. This feature had a great impact on the

emergence of hyper communication in the Internet system. As a result, an opportunity to establish communication between texts was created. Then, in 1989, Tim Berners-Lee proposed a new, improved form of hypertext "worldwide" in response to the demands of the information exchange. Later he created its prototype. At first glance, this problem can be understood more by computer or mathematical technicians, but journalism also performs the service of creation and content creation due to the capabilities of the techniques. That's right, he should be evaluated not only as a *duretiyshilik*, but also as a *duretiyshilik-technician*. M. McLuhan, in his article titled "Victory media itself is content", says that he believes that electronic technologies feed and motivate journalism. In his opinion, "Electronic communication is changing the rule of "time" and "space" and is gradually turning into content." That is, technical measures are an indicator of the four-step process.

A lot of research has been conducted on hypertext in the West. S. Xanadu, T. Nelson" [2], G. Lelia, S. Douglas, H. Mishael, D. Andries" [3], J. Conklin, S. Sissoni" [4], J. David, B. Scientists such as Belinda and A. Sosnin studied hypertext and hypertextuality issues, its implementation methods, and its own characteristics. K.I. Robertovna"[5] studied it as a communication tool, while S.A. Stroikov"[6] sees the peculiarities of the use of hypertext in contexts. And, while A. Sosnin studies hypertext in terms of artistic literature, T. Gornyakova dwells more on the issue of hypertext in linguistics. A. Ulbert wrote that "hypertext is a natural extension of text space" in his article devoted to the advantages of hypertext in modern journalism. This means that any text can have certain characteristics than other texts. In his view, hypertext is used to enhance the hierarchical meaning of vertical order in two interconnected text landscapes. In Yu. Kristeva's classic work "Bakhtin, word, dialogue and novel", we can see that the term hypertext, which refers to the theory of intertextuality, is defined at the "phase, vertical" level. According to him, the most important thesis is that every word in the text has different projections. The universal theory of hypertext, which is widely used among scientists, is a solution to intertextuality using computer technology. E.G. Sokolov sees hypertext "... as a satisfactorily discrediting the aesthetic and informational content of the text" [7].

This grandfather should be an international thinker and learn it in a variety of subjects. Therefore, research related to the distribution of hypertext is becoming more and more popular today among foreign countries. In the theory of Uzbekistan journalism, the number of those who tackled the topic is a minority. Only D. Rashidova, N. Qosimova briefly touched on the concept of hypertext and its impact on Internet journalism. At this point, we think it is appropriate to look at the theoretical versions of the term from a journalistic point of view, and create a concept of size based on its own characteristics and signs. For this purpose, we will present its theoretical definitions between chapters.

In our opinion, the term hypertext should become a symbol of the text itself. The changed text is copied to the desktop monitor screen and then transferred to the electronic branches. Hypertext consists of the following texts:

- Non-linear;
- multimedia;
- interactive.

The combination of these views leads to a change in the author's service. The composition, the beginning and the end of the material, where the author expresses his opinion, loses the traditional forms, and the authorship remains conditional. In addition, you can have other options: transition between texts, high-quality visualizations, video and animation, audio input. As a result of similar changes in the methods of "publishing" and publishing texts, the author can have his own work with the most original appearance.

Hypertext is one of the most suitable and adequate models of system information presentation, which visually conveys semantic branch trends. As a result, not only the text, but also its compositional units and fragments can have connections and informational value. From this point of view, hypertext has a great significance in checking the objectivity of visible messages.

In the description of the most common type of hypertext, it should be noted that it is different from links. Hypertext is a link that contains hyperlinks and connects the relevant text to another destination, the text of the information in the space. That is, "Hypertext is a new form of creating a collection" [8]. At the same time, it affects the appearance of text, audio and visual forms based on hyperlinks. It creates a wide opportunity for interactivity. Hypertext links are connected to other materials, and news that branches to each other becomes a new semantic context and a crystallisation of the topic. It consists of a collection of potentially unlimited texts combined in a systematic way.

As already noted, hypertext has interdisciplinary definitions. For example, in computer terminology "... hypertext is a markup language used from hyperlinks" [9]. In short, it is the code of reading language for intertextual communication. Hypertext links are becoming more and more characteristic of online journalism. For that reason, many scientists associate hypertextuality with the inherent properties of Internet media. Hypertextuality is the most important feature of Internet journalism, and as we mentioned earlier, it refers to improving the flow of information with the help of hyperlinks. "Hyperlink is a text (from one character to the full text) selected in a graphical way to the next row of information (internal links) or to another site (external) links to its work" [10]. It has four fundamental characteristics related to Internet media:

- as a technical element of web design;
- defining the purpose of the site;
- information base;
- as a characteristic of the content.

Hypertext is a logical element that allows to expand the context of clear communication. It creates conditions for the student to understand what he has been given and helps to control the flow of information. Also, it is a method of combining information sets in one or more linear ways. And, in fiction, such a text is "... a book with internal links, that is, it is sent from one part to another" [11]. In this work of art, the intertextuality of the intertextuality technique is intensified in the character of broadcasting. And in journalism, the concept of hypertext changes the conceptual information landscape. Along with that, it is also necessary to mention its role in changing traditional writings. "Many people consider hypertext to be an important part of victory communication tools. Its uniqueness is the lack of hierarchy" [12], says R.K. Potapova. In the hypertext landscape, all objects have the same meaning and are at the same level for the user. Therefore, hypertext in journalism is also a semantic system, connecting any content based on the structure of internal communications, technical conditions, and a set of tools, giving a person the opportunity to change the composition of semantic communications and overcome the transition in the environment of interconnected elements.

According to T. Nelson, "hypertext builds an information system, makes information available on demand" [13]. The researcher also calls hypertext information branching. In this case, the continuous connection of the text with the texts in the context of other clauses is not taken into account. Also, the Oxford dictionary defines the term as "... a collection of documents that includes other information such as text, audio, video linked to one text by means of mutual links"[14]. That is, it is noted here that several texts are combined to form a long-read format database. "Hypertext is a bridge text of information on the Internet. In other words, it is a direct connectivity tool. The communication component specifies the synergy of the branch's communicative features" [15]. In this case, the text pages are controlled by special commands and actions given to the screen. In addition to the relevant text, it is possible to add diagrams, pictures, and videos. Hypertext is defined as "... a combination of properties and relationships in the environment of pre-created texts" [16]. According to the theory of A. Sosnin, "... it is a labyrinth between texts" [17]. A hyperlink leads to the same labyrinth. According to E.V. Zykova, "... this is the process of combining information with other information" [18]. But, in our opinion, it is the opposite. The combination of information gives a face to a single idea. This connects the materials to each other. This transformative idea greatly strengthens the connectivity between texts and ensures that the materials

are connected to each other according to the content compatibility. As a result, the reader will be able to read the article in a complex way and get a wider acquaintance. At this point, it should be noted that hypertext is a communication between texts, which is content-related, but differs from each other in terms of form, genre, structure, language, and intertextuality. This also creates an opportunity for the audience to get acquainted with the branched complex materials at the same time or to read the text in the original. For example, the news "Six countries of the EU have joined declarations on guarantees for Ukraine" published on the website of "Ria Novosti" on December 24, 2023 linked to the website "Political country" of Ukraine and established a semantic connection. This site has given a link to "Monokol" internet publication. It is possible to see that the material on the three web sites connected by links is different from one another in terms of genre and structure. "Ria Novosti" used the form of a report to reveal the topic, "Political country" reported it, and "Monokol" website presented it in the form of an article. This can prove to us that hypertext is a thematic unity, and genre, language, and style are subject to rapid change. Also, R. K. Potapova notes that it is "a type of text that is not linear, but contains only a few pieces of information" [19]. The opinion that "the text is composed by several authors working together and writing it properly" [20] is also increasing.

In short, hypertext is an electronic text format that defines the way to create a multimedia work. It can be considered a large text.

Among the opinions expressed about hypertext, we like the theories that it is more of a structure than a volume. "Hyper is not a volume, but a structure. That's right, it's a structured text" [21], prove our opinion. Among the unique features of this text, it can be mentioned that its volume combines various materials and performs structurally adequate creation service for each material. That is, it connects all kinds of information in the form of a branch of nodes, which the user can see at his own discretion, and how to enter them. "Hypertext provides a unique user interface for many large classes of stored information, such as databases, computer documents, and interactive help systems" [22]. As a structure that is more appropriate to the specific features of the ISS, it acts as branches or meta-templates of potential texts. The importance of hypertext in computer and web-connected form is that it helps to find scattered information faster, collects, selects, searches and distributes information. Online text gives the journalist the opportunity not only to read information in a complex way, but also to work on the text and edit it.

Hypertext news means that communication nodes and information exchange processes are strengthened. In this process, the material can be connected to each other in space and time by links, and it can acquire its own identity, as if it tends to fill or replace the relevant news content.

We distinguished the following characteristics of hypertext from a journalistic point of view:

1. Harmony of hierarchical linear.

The text created by the journalist is linear. However, the materials written by several authors in the hypertextual process are not linear, they are hierarchical. During reading, the previous text linearity disappears due to the link, and a new text linearity appears. A joint harmony of two text types appears.

2. Structural elements of hypertext.

Hypertext elements can be electronic written texts of any length. The author's opinion is presented in the first pages. In general, the structure of the text of the second and third authors is linear. It consists of various graphic structures. It should be noted that although there is a possibility that they consist of a graphic structure, and there is semantic coherence in the communication between texts, there is no possibility that structural changes will lead to changes in terms of genre requirements. And traditional text builds a unique system with its own structural elements - sections, paragraphs. However, in this system, all elements are arranged in order of readability. Hypertext elements are in any case an autonomous box outside of it. Due to this autonomy, they can be included in different semantic lines and read in different searches.

A method of transition between non-linear texts

There is no need to separate the need to read the next fragment next to it after reading the linear text fragment that is to be read step by step. More precisely, the linear text is essentially continuous, and it does not explain the way to stop the reading in order to select the next reading. Fragments in the material serve only to give the reader the opportunity to choose according to the purpose of the study. In this case, the reader stops reading the text step by step and abruptly moves to another fragment - another element of the hypertext.

1. Content communication

In hypertext, transition is possible only if the fragments are content related. As a rule, this type of hypertext acts as a supplement to the information or advocating for another content-related article, tends to prove facts, and acts as a copyright infringement. That's right, as the most fundamental feature of hypertext, we can point out that its content-related materials are branched.

2. Visual representation of hypertext structure.

Intertextual transition and one meaning is directly related to its visual appearance. It should also provide the service of combining the video or other multimedia format illustrations with the text as a structural part of the text. This background text expands and combines with information from other sources to create a whole material. For example, on November 24, 2023, the article "Man rescued from burning building in England" was posted on the "" agency website. There, the reporter included in the text structure a video report published on another social channel of the agency. To watch this video, the audience must go to that location. The reason is that it is a part of the text, and we can see that a visual text connection is provided with a larger video report.

3. The author has changed the character of the reader

In hypertext, the author should create a technical system of intertextual transition. In this process, the reader cannot fully follow the logic of the author's text. This is because it is possible that the reader will follow the path shown by the author with the help of links and go to other additional information. If in a traditional text the reader accepts information based on the author's logic and linear ideas drawn by the author, this tendency may disappear in the hypertext. That is, it is possible for the student to accept the information as much as he wants and not to follow the path indicated by the author based on references. Therefore, hypertext allows the reader to choose the way to read, while the author preserves the sovereignty of the text landscape. From this point of view, it is too early to talk about fully verifying the concept of authorship in the field of hypertext. For example, A. N. Baranov writes that "hypertext does not have an author in the traditional sense - it has many authors, and the group of authors for hypertext is always changing" [23]. Also, the reader can have freedom of action in the hypertext landscape.

At the present time, the priests support and provide information in the form of hypertext. This point of view is often emphasized in the theory of RK Potapova. We can cite several reasons for this:

- creates an opportunity for the hypertextual journalist to establish communication between texts;
- opens the way to multimedia text creation, i.e. offers services for combining video, audio, slide shows;
- plays a big role in copyright enforcement;
- enables the audience to choose and read different materials with the same content, but from a structural point of view;
- offers complex materials on the topic.

These features of hypertextuality are important in journalism in the areas of text structure, information collection, copyright, inter-text communication.

In hypertext, context, link, illustration are evaluated as separate structural elements. An article written by the author and placed on the website in electronic form forms a contextual unit. The fact that there is a link in the material, and the connection of the relevant page with other information, also means its structural integrity. At the same time, we can evaluate the illustrations

that serve as an extension to the text as structural features of the hypertext itself. These three symbols define a hypertext structure.

That's right, hypertext journalistic problems are not reduced to solving the problems of the field, as we have seen with the emergence of such branch technologies. An important part of modern Internet journalism is the theory of hypertext, the structure of its content, compositional units, communication trends, etc. These and other questions will be discussed in other paragraphs of this scientific work.

In short, hypertext is a technical and organizational difference of the Internet. It is recommended to reduce the number of additional hyperlinks added to the text in order to solve the difficulties that arise in the communication processes related to the structural differences of the hypertext, to avoid using "For Information" appendices to relevant information as much as possible, to place multimedia signs in the norm, and to leave the relevant versions of the texts in the internal links unchanged according to the unity theory. let's play . Also, the absence of the number of recent hyperlinks on the sites obtained during the special analysis showed that there is a situation of changing and reprinting the text in the chapter.

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Rezyume: Gipermatnning xususiyatlari va uning modeli masalasi lingvistika, axborot texnologiyalari, tarixiy nuqtai nazardan o'rganilgan bo'lib, ammo jurnalistikada to'liq tahlil etilmagan. Biz uning boshqa internet jurnalistikasining xususiyatlaridan ajratib olib o'rganib chiqishni maqsad qildik. Gipermatn bu bir nechta matnni semantik jihatdan bir biriga bog'lash amaliyoti hisoblanadi.

Резюме: Характеристики гипертекста и вопрос его модели изучались с лингвистической, информационной и исторической точек зрения, но не были до конца проанализированы в публицистике. Мы стремимся отличить его от других функций интернет-журналистики. Гипертекст — это практика семантической связи нескольких текстов вместе.

Kalit so'zlar: Gipermatn, gipermedia, algoritm, ommaviy axborot vositalari, kontent tahlili, giper, Teodor Nelson, giperhavola, ulanish

Ключевые слова: Гипертекст, гипертекстуальность, алгоритм, СМИ, контент-анализ, гипер, Теодор Нельсон, гиперссылка, связь.

**PEDAGOGICAL PSYCHOLOGICAL VIEWS OF EASTERN THINKERS ON THE
FORMATION OF THE SPIRITUAL-MORAL CHARACTERS OF PRIMARY SCHOOL
STUDENTS**

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Summary: *In this article, the pedagogical and psychological views of the Eastern thinkers on the formation of the spiritual and moral qualities of the students of junior school age, the role of spirituality as a bridge connecting the ancestors to the generations, the past to the present, and the present to the future are scientifically and theoretically analyzed. Also, in the article, the methods of inculcating qualities such as bravery, bravery, justice, loyalty, humanity, and politeness, which are expressed in the oldest written and oral educational monuments, are detailed.*

Keywords: *Eastern thinkers, a student of junior school age, spiritual and moral qualities, pedagogical and psychological views, spirituality, the heritage of ancestors, the younger generation, the oldest written and oral educational monuments, courage, bravery, justice, loyalty, humanity, tact, people, history.*

It is known that the greatness of our nation's history is determined, first of all, by the high level of spirituality and enlightenment. Our great ancestors, such as Imam Bukhari, Imam Termizi, Abdul Khaliq Ghijduvani, Bahauddin Naqshband, Muhammad Musa Khorezmi, Ahmad Fargani, Ibn Sina, Abu Rayhan Beruni, Amir Temur, Mirza Ulugbek, Alisher Navai, Zahiriddin Muhammad Babur, contributed to the development of mankind, especially science, made a great contribution to the rise of spirituality and enlightenment. The great kingdoms created by the Timurids and Baburis, and the magnificent historical monuments built under their leadership continue to amaze the people of the world as bright examples of the genius of our people.

From "Avesta", which has a history of almost three thousand years, "To'maris", "Sukhayl and Guldursun", "Orhun-Enasoy", "Nightmare", "Hidaya", "Al-jabr wal muqabala", "Laws of Medicine", "Devonu lug'atit turk", "Qutadgu bilik", "Devoni hikmat", "Qissasul-anbiyo", "Khazoyinul maoniy", "Khamsa", "Boburnoma" cannot be counted. This treasure of jewels, accumulated over the centuries, has passed various tests of history and helped people in difficult times. In this sense, they have rightfully become the spiritual property of mankind as unparalleled masterpieces of world literature.

It is worth saying that the role of spiritual and moral values in the world civilization in the work of Central Asian thinkers, the product of enlightened high thought does not lose its importance even for today's development. Spirituality acts as a bridge connecting ancestors to generations, the past to the present, and the present to the future. It is the total of good qualities and qualities, values and

the set of traditions, moreover, embodies all the historical and social experiences and views of our ancestors.

In our opinion, based on the use of the historical heritage of Central Asian thinkers:

firstly - to assess the greatness of moral qualities in the works of the Middle Ages Muslim East, which are considered a high spiritual and scientific source, from the point of view of national and universal values;

secondly - scientific research of the moral-aesthetic essence of pandnoms related to our scientific and cultural heritage of the past, to reveal their value science nature;

thirdly, to approach moral, aesthetic concepts and specific words from the sources from a modern point of view and show their priority in the process of creating a humane society;

fourthly - to inculcate in the minds of students the essence of modern and religious concepts of morality in the concept of a perfect person - faith, or - honor, justice, conscience, the meaning of life, goodness;

For this purpose, we recommend paying attention to the following when organizing and conducting summer health activities.

In the course of our scientific research, based on the principle of historicity, we tried to shed light on the essence of the pedagogical and psychological possibilities of improving the system of formation of spiritual and moral qualities of children of primary school age at children's health camps.

"Good thought", "good deed", and "good idea" are the main ideas of the teachings of "Avesta", which is considered the moral encyclopedia of the ancient world. Most of the wisdom in the Avesta deals with ethical categories such as truthfulness and lying.

In Imam al-Bukhari's work "Al-Adab-al-Mufrad" the essence of spiritual perfection, through hadiths related to education and training, aimed at teaching students science, knowledge, and craft, connecting the inner world, spiritual image of a person, the moral criteria of the past and the moral criteria of the present era. It is explained that it is to be kind to the little ones and to be respectful to the elders. The practical-pragmatic value of hadiths is that national values, noble traditions, our language, and the tenets of our holy religion have a positive effect on raising the consciousness of our students.

In world culture and science, Umar Khayyam reflects the dialectical thinking as an ethical scientist in the work "Navro'znama" through his views that beauty in human and social relations is the result of love, open-faced behavior creates perfection.

In the work "Hibbatul Haqayyq" by Ahmed Yugnaki, it is mentioned that moral criteria concepts are manifested through human speech, mind, emotions, intuition and perception. Yusuf Khos Hajib's work "Kutadgu Bilig" interprets the enjoyment of beauty as a matter of morality, while virtue and delicacy are interpreted as spiritual values.

Relying on the immortal legacy of our scholars, we can say that the long past, truthful historical periods, experiences, and purposeful development of each nation are of great pedagogical importance in determining the ideological essence and strategic direction of spiritual education.

Based on the above, it can be said that the improvement of the mechanisms of organizing spiritual and educational work of children in health camps is determined by social relations and types of human activities. The more diverse the students' activities, the richer their social relations, the richer and more complex their world view and interests. In the process of educational work, referring to the views of national heroes such as Alpomish, To'maris, Shiroq, statesmen and generals such as Amir Temur, Ulug'bek, Babur, and scholars such as Farobi, Ibn Sina, Beruni, forms the basis of forming the spiritual and moral qualities of young people. Moral education has a much broader meaning and teaches a person to perceive the norms of behavior in nature and society. Well, on the basis of what pedagogical mechanism are these structural aspects of the formation of moral and moral qualities of students of junior school age in the children's health camps, which are the subject of our research? This mechanism is a complex process, and its implementation requires the organization of the educational process based on the innovative ideas advanced in didactics, educational theory, and educational management. Also, active participation of all institutions in the society, i.e. family, educational institutions, relevant ministries and agencies, civil society institutions is also required in this process.

In order to embody the lessons of history before the eyes of children, it is necessary to expand the scope of activities that introduce the way of life of our past generations, their noble qualities, and the way of creativity. In this regard, it is appropriate to organize and hold various events, conversations, meetings, radio programs, wall newspapers, and exhibitions that illuminate the pages of the lives of our great scholars, Sarkar and our grandfathers.

Also, attention should be paid to the external decoration of the camps. From his name to the porch, swimming pool, kitchen, playground, library, stadium, everywhere, necessary slogans, education and upbringing advices of our sages, instructive wisdoms are written with taste and aesthetic pleasure, it will undoubtedly serve an educational purpose. . It should be the first task to educate young students resting in the camp in the spirit of love for national and spiritual values, our

cultural heritage, folk pedagogy, historical heroes and scholars. Wellness camps give children a chance to do their favorite activities in a new place, with new friends, and to try their skills in modeling, painting, music, science, and sports. Creating a series of didactic materials such as TV programs for children, bright, colorful manuals decorated with various pictures, multimedia products under the heading "Educational school", revising the functional tasks of pedagogues responsible for organizing spiritual and educational work in children's health camps, "education" in the field Ensuring "science-production integration" is one of the priority tasks. Also:

- to protect students from the influence of foreign ideas, to educate them in the spirit of loyalty to national and universal values, religious tolerance and inter-ethnic harmony;
- promoting the national idea among students, instilling in them a sense of respect for state symbols and national values, conveying the essence of the implemented reforms to the youth;
- to create and promote images of "Heroes of our time" who will be an example to students in every way;
- organization of systematic work aimed at promoting the spirituality of our people, the idea of national independence, and elucidating the essence of today's reforms among children in mass media, cinema, theater and music.

Based on the analysis of historical and pedagogical literature, we can say that the way of life of educated and wise people, the works of unique Eastern thinkers, which serve to improve human behavior, promoted goodness among people and had a great impact on their maturation. Therefore, the qualities such as courage, bravery, justice, loyalty, humanity, politeness, expressed and appreciated in the oldest written and oral educational monuments, were not formed in a person by themselves. Nature and social changes in the life of society, the lifestyle based on primitive seed production required that a person should have such qualities. Most of the legends that served to illuminate the dreams, thoughts, goals and aspirations of the people of the primitive system are known to us through the oldest monuments - "Avesta", "Shahnoma" by Abulqasim Firdausi.

The problems of personality and spiritual moral maturity have been one of the main issues in the focus of attention of the most advanced people of society, scientists, scholars and sages for centuries. In the ancient book of Zoroastrianism - "Avesta", ideas about child upbringing are described, great attention is paid to raising children to be pure, moral, good-minded, knowledgeable in all the crafts of their time, strong in faith, morally and physically perfect. Zoroastrian appeals to his children to "be zealous and courageous in the pursuit of an honest living." This is one lesson that never gets old. Adopting a healthy lifestyle with honesty is one of the important factors that serve to form social consciousness in minors [1;].

Thus, the ideas about the formation of spiritual and moral qualities of the growing young generation advanced in folklore and "Avesta" can be explained as follows:

- that giving birth to a healthy child and giving him a beautiful name is a prelude to the socialization process;
- consideration of individual characteristics of boys and girls in child rearing;
- the importance of the father's role in raising children;
- achieving superiority of the role of national and universal moral culture in child education;
- the role of national and religious values in the formation of social relations.

Pedagogical scientist N.M. Egamberdieva writes that the spirituality of any nation or nation cannot be imagined without its history, unique traditions, life values, in this regard, of course, spiritual heritage, cultural treasures, old historical monuments are the most important factors. does. Among such historical monuments, which express the life experience, religious, moral, scientific, and literary views of our ancestors, the invaluable spiritual monument called "Avesta" created in the Khorezm oasis almost three thousand years ago has a special place [6;].

In fact, the incomparable role of the written monument "Avesta" in the process of educating the spiritual and moral qualities of young students is that it teaches people to do good and benevolent, and shed light on the place and role of a child in society from the point of view of the social environment of that time. [1;].

It is known that in the Holy Qur'an and Hadith Sharif, which are the holy sources of Islam, child education is considered as the first and noblest issue, and much attention is paid to the issues of manners, duty of husband and wife, child education. Educating children, making them aware of the secrets of worldly and religious sciences is based on the belief that knowledge and intelligence are the criteria of socialization promoted in the Qur'an and Hadiths. In Islam, information is given not only about the divine sciences, but also about worldly knowledge.

The most important component of the ideas put forward in Islamic teachings is teaching our children to observe purity and cleanliness in the process of socialization, forming mental, moral and physical qualities in them, in a word, the issue of raising a perfect person serves as an important resource. Hadith is the main source after the Holy Qur'an that illuminates the foundations of Islamic teachings. It is known that in Islamic teachings and hadiths, care for parents, respect for elders, not betraying one's trust, and not telling lies are one of the highest virtues. It is also emphasized that parents and teachers should educate their children, teach them manners, and do good. [2; 37 b].

Therefore, the Hadiths are the Sunnah of our Prophet Muhammad, and in essence strengthen the faith and belief of every believer, "Since Islam is based on enlightenment, it consists of belief and faith to bring every person to perfection mentally and physically, only to serve goodness, to be noble, to walk cleanly." , to eat one morsel honestly, to avoid ignorance and ignorance, to protect the values of one's brother, relatives, nation and homeland" [2;]

Thus, the human qualities required for the formation of spiritual and moral qualities of young people promoted in hadiths can be explained as follows: advice to parents on giving birth to a healthy child; taking into account age characteristics in the education of a perfect person; acquisition of religious and secular knowledge; to be noble, to walk cleanly, to achieve the supremacy of duties and tasks before the family and country, to serve goodness.

In the opinion of Abu Nasr Farabi, who made a great contribution to the development of pedagogy, in the upbringing of a child, justice, intelligence, prudence, eloquence, health, love of truth, striving for enlightenment, strong memory, perseverance, courage, self-control are formed through the external environment and communication with other people. , a person acquires and achieves them with the help of his activity. It is worth noting that the qualities recognized by Farabi, today as criteria of moral education, are an important factor in forming the spiritual qualities of young people, ensuring human rights and freedoms, realizing our identity, and maintaining peace, tranquility, and stability in every household. [3;]

The great philosopher of the Middle Ages, Abu Rayhan Beruni, was famous as a scientist who made a great contribution to the development of world science in his time. serves to form. Abu Rayhan Beruni describes the issues of spiritual perfection in connection with the universe and the whole being. He connects moral categories with human character, glorifies knowledge and entrepreneurship in management and political affairs. According to him, there are many branches of evil, but their basis is three things: greed, anger and ignorance. [4; 30 b].

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Rezyume: *Ushbu maqolada Sharq mutafakkirlarining kichik maktab yoshidagi o'quvchilarning ma'naviy-axloqiy fazilatlarini shakllantirish, ma'naviyatning ajdodlarni*

avlodlarga, o'tmishni avlodlarga bog'lovchi ko'prik sifatidagi roli haqidagi pedagogik-psixologik qarashlari bayon etilgan. hozirgi va kelajak uchun hozirgi zamon ilmiy-nazariy jihatdan tahlil qilinadi. Shuningdek, maqolada eng qadimgi yozma va og'zaki tarbiyaviy yodgorliklarda ifodalangan mardlik, mardlik, adolat, sadoqat, odamiylik, odob kabi fazilatlarni singdirish usullari batafsil yoritilgan.

Резюме: В данной статье изложены педагогико-психологические взгляды восточных мыслителей на формирование духовно-нравственных качеств учащихся младшего школьного возраста, роль духовности как моста, соединяющего предков с поколениями, прошлого с настоящим и настоящим в будущее анализируются научно и теоретически. Также в статье подробно рассмотрены методы воспитания таких качеств, как отвага, отвага, справедливость, верность, человечность, вежливость, которые выражены в древнейших письменных и устных воспитательных памятниках.

Kalit so'zlar: Sharq mutafakkirlari, kichik maktab yoshidagi o'quvchi, ma'naviy-axloqiy fazilatlar, pedagogik-psixologik qarashlar, ma'naviyat, ajdodlar merosi, yosh avlod, eng qadimgi yozma va og'zaki tarbiyaviy yodgorliklar, mardlik, jasorat, adolat, sadoqat, insonparvarlik, xushmuomalalik, odamlar, tarix.

Ключевые слова: восточные мыслители, учащийся младшего школьного возраста, духовно-нравственные качества, педагогико-психологические взгляды, духовность, наследие предков, подрастающее поколение, древнейшие письменные и устные просветительские памятники, мужество, отвага, справедливость, верность, гуманность, такт, люди, история.

SELF-CONTROL AND MANAGEMENT

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Summary: *This article talks about self-control and management methods of Avir athletes. In the article, the results of modern research and the methods of development of self-control and management of movements of the elite athletes of the day and night athletes were studied. The obtained results revealed the strategy of modernization of the methodology of development of self-control and control of the movements of the athletes.*

Key words: *self-control. Management. Subjective. Objective.*

Introduction. Self-control is closely related to the health status of the athlete. It is important to know that while closely monitoring one's own health, weight training will be effective and will take place in a way that does not put a strain on the health of mistresses. Self-control makes it possible for the athlete to consciously monitor the physical development as a result of general and special physical fitness training and its subsequent condition, changes in the effectiveness of nutrition.

Subjective and objective self-control. The minimum requirement for self-controlling is to keep track of various anthropometric score in regular as well as the image of the stroke. Self-control arguments are conditionally divided in two groups.

Subjective and objective arguments. The general condition is characterized by sleep, appetite, ability to work mentally and physically, positive and negative emotions. After the training, a person should feel yourself refreshed, have a good mood, have no head, lack of medication, do not feel tired. With regular exercise, sleep should generally be good, a person should fall asleep quickly, and feel comfortable with sleep. If it is difficult to fall asleep after training, and if sleep is restless (and this is repeated every time), it can be concluded that the loadings being done are not suitable for physical fitness and age.

Appetite should be good after physical loads. It is not recommended to eat as soon as the training is over. It is best to drink a glass of mineral water or juice to quench the thirst that has waited 30-60 minutes. If the general condition is that sleep, appetite worsens, reducing loads if this does not help, it is necessary to consult a doctor. It should be noted cases of violation of the daily routine and how they are reflected in the catwalks. Objective indicators of self-control include the image of heart contraction (stroke), arterial pressure, breathing, lung's vitality, (syrometry) weight, muscle strength, sports loads.

Time to self-control. The athlete begins to self-control as soon as he is ashamed of his sleep. He notes: what kind of sleep it was –deep, calm or long-leaved dreams. Whether the trigger from sleep is mild or sleepy, feels sluggish. The stroke (the stroke is performed by counting the number of strokes within 1 minute in the position lying between the end of the second, third and fourth fingers above the wrist artery). In this case, it is necessary to pay attention to the rate of coagulation of the vascular stroke . In outdoor track and field athletes, the pace of stroke in a calm state is about 50-70 minutes of stroke. (everyone is obliged to know the image of the stroke of himself.)

The heart of a healthy person works rhythmically, with contractions repeated at a strictly defined time. A violation of this rhythm can give evidence of a disease of the heart nervous system. In healthy people, the arteries are well. After a large physical load, the fulness of the vessels decreases over, but after rest, it returns to the previous state again. In the state of the organism, above all, the functional state of the central nervous system is reflected. A good mood, vivacity, performance, desire to exercise indicate that the general state of affairs is in demand. Appetite is of great importance in this. It may be good, satisfying, loud, poorly or not at all (the thirsty strong is also observed in the last.)

Good appetite digestive juices are released in the body and the digestive glands are prepared to digest food. In this way it creates conditions for good assimilation. Poor appetite or lack of indicates illness or severe fatigue. Excessive strabismus also causes a decrease in appetite.

The ability to work is due to the health condition of the athlete. It is very important that athletes control the weight of the himself. Because each athlete participates in competitions in a certain weight class. Individuals who have never been involved in the Sport and have begun to regularly attend athletics catwalks usually initially weigh around a dozen. This happens as a result of pumping out excess water and activating oil. Due to regular exercises, the weight can go around without changing for a certain month.

But later begins to increase. With outdoor athletics, regular weight gain is prone to that right adaptation reactions are occurring to the body's power loads. Information obtained by observing the body should be immediately included in the self-control diary. Then from the first time or long break with outdoor athletics records that individuals who are sitting have developed an acute in the muscles after the workout. This is because intense activity increases muscle tone.

They are topped in quantities of many of working-time shredding products. An insufficiently similar organism does not have time to expel or neutralize these products. Muscles worsen their blood supply when Tony is trained. Such muscles are felt when they are tired or pressed. In a well-trained athlete, these muscles can grow if he gives a group of muscles a load than usual for the first time. In addition, studies in recent years show that muscle tone is due to the polarization of the cell membrane. It changes to polarization as an inverse function. The polarization of the cell membrane is related to the relationship between Ion on both sides of the membrane and especially the concentration of potassium in Cell Work. The decrease in muscle tone is due to the fact that its return to the normal occurs within the cell, depending on potassium.

Evaluation of the reaction of the cardiovascular system. Málumki is a reliable kórsatkichi of the samegullity is the picture of heart contractions (stroke). He bóladi at 70-75 beats per minute in adult men in a calm state and 75-80 beats per minute in women. In people who exercise, the stroke is 60 or less per minute rather sluggish, in athletes who exercise kóp, 40-50 beats per minute and even less, which indicates that the heart works sparingly. In a calm state, the heart contraction is the age of the person, gender, body position (vertical or horizontal). As the age grows, the image decreases.

In the solomlom Kishi, the stump stroke in a calm state bóladi without rhythmic continuous zóriq in one Meyor.

To be considered rhythmic, the number of beats per 10-second cut must vary from exactly the same bólishi kópi to a single beat. A sharp difference in the number of heart contractions in 10 seconds (for example, 10 times in the first 10-second 12 times in the second, 8 times in the third) indicates arrhythmia. A stroke can be performed in the forearm artery in the area of the heart in the chakra and in the sleep arteries.

To do this, you need a stopwatch or a simple clock with a shaft per second. Any even small physical load accelerates the stroke. In scientific research, it has been proven that there is a tógridan-tóóri bias between the image of the stroke and the size of the physical load.

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Rezyume: Bu maqolada Awir otletikashilardiń o'zlar -o'zini ish va nazorat qilish va boshqarish harakatlarin va ularning rivojlanish usillari haqida so'z etilgan. Maqolada ushbu kunga qadargi soha olimlarining og'ir atletikashilariniń o'z -o'zini ish va o'zini nazorat qilish va

boshqarish harakatlarini rivojlanish usillarini rivojlantirishda zamonaviy izlanish natijalari va metodikalari o'rganilib chiqildi.

Резюме: В данной статье рассказывается о методах самоконтроля и управления спортсменами Авира. В статье изучены результаты современных исследований и методы развития самоконтроля и управления движениями у спортсменов высокой квалификации дневных и ночных спортсменов.

Kalit so'zlar: o'z-o'zini nazorat qilish. Boshqarish. Subektiv. Obyektiv.

Ключевые слова: самоконтроль. Управление. Субъективно. Цель.

**COMPETENCY DEVELOPMENT OF STUDENTS STUDYING AT A HIGHER
EDUCATIONAL INSTITUTION THROUGH MUSIC LESSONS**

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Summary: *The article is on the topic of developing the competence of students studying at a higher educational institution through music lessons, and it analyzes: Musical competence, personality traits, education of students in the spirit of love for national music, and humanitarian ethics.*

Keywords: *Music education, educational system, moral and aesthetic education, social culture, competence, current, aesthetic competence, musical competence, priority task, characteristic, musical significance, society, spiritual restoration, aesthetic cycle, love of music, child's heart.*

Introduction.

Musical competence. Music education occupies an important place in the educational system, because moral and aesthetic education of schoolchildren is an important aspect of personality development and education.

At this point, I would like to quote the thoughts of the ancient Greek philosopher **Plato**[20], who, together with his teacher Socrates and his student Aristotle, shaped Western culture, as well as a mathematician, writer and founder of the first academy in Athens: *"Music inspires the whole world, provides the soul with wings, helps the imagination to fly. Music gives life and joy to everything. It can be called the epitome of beautiful and sublime things."*



Vasiliy Aleksandrovich Sukhomlinsky[18] (1918-1970), Ukrainian innovative teacher, children's writer, creator of the pedagogical system based on the recognition of the child's personality as the highest value, said: *"Music education is not the education of a musician, but the education of a person. Music is a powerful source of thought. Full mental development is impossible without musical education. Music unites the moral, emotional and aesthetic spheres of a person. Music is the language of emotions. Believe in the talent and creativity of every student,"* he said for nothing.

The main part.

In the conditions of modern social culture, the task of moral and spiritual restoration of society is especially urgent, which is largely related to the availability of aesthetic competence of specialists. From this point of view, **"musical competence"** should be considered as an integral part of individual competence in modern society as a priority in the organization of music education in educational institutions[8].

From this point of view, **"musical competence is a characteristic of a person"**, which implies the following:

- musical knowledge;
- ideas about the nature of the interaction of music and aesthetics;
- ideas about the nature of interaction between music and education;
- willingness, ability, skills to use in aesthetic, musical, pedagogical activities;
- musically important personal qualities (sacrifice, high morality, knowledge, empathy, creativity, tolerance, artistry, knowledge, professional communication culture, etc.).

Based on the above, it can be assumed that the value of musical competence consists in expanding the boundaries of knowledge about the world, society, nature and man, thereby enriching people's lives, educating their feelings, increasing sensitivity to the aesthetic properties of sound.

The main and most relevant aspect of musical education and training in modern conditions is self-knowledge of the graduate by assimilating the values of the music culture of the Tajik people as part of the world music culture. Learning music itself is musical education, therefore, music education technologies should simultaneously educate a person's musical culture.

Education of students in the spirit of love for national music. Music education has always been of special importance. Rather than educating students in the spirit of love for national music, the purpose of music education should be considered much broader. Acquainting students with the national music culture brings them closer to understanding and mastering the features of both national and world music in the context of their spiritual and moral value components.

On the other hand, in order not to face the problems of deformation of the intonation structure of folk music in modern conditions, today we should strive to strengthen the national identity.

The end of the 20th century and the beginning of the new century were characterized by the development of two multi-directional processes in the regions of the former Russia, on the one hand, federalization (preserving a common economic, educational, cultural space), on the other hand, regionalization (decentralization, political, economic and cultural development on its own). strategy).

Federalization — (from the Latin word *foederatio* "unification, union") is the process of bringing together previously separate units and implementing the principle of federalism in the political-territorial structure of the country (or in the organizational structure of a party, public organization), or dividing a previously single, unitary state (organization) into its constituent parts - division into subjects of the federal subject. Like any transition, federalization first requires clarification of what it is a transition from: fragmentation to confederal or federal unity or full unity, unitarism to federalism or confederation. In the first case, federalization reflects the tendency of centralization, in the second – decentralization[19].

Accordingly, it is necessary to achieve a balance of the interests of the republics and the federal state in order to avoid conflicts of interests. The relevance and importance of the "national issue" comes from the fact that it is impossible to solve it without raising the general cultural level of the young generation, without having a positive attitude towards their national culture, without cultivating the culture of inter-ethnic communication, without developing the ability to communicate with peoples. understanding and acceptance of foreign cultures of other ethnic groups.

One of the most important tools to help solve this problem is education, which is a method of actively introducing students to national culture using the opportunities of the national-regional component.

In addition to the Law "On Education", this problem includes the national-regional component of the content of education.

The component of the Law "On Education" defines the standards, compliance with which ensures the unity of the educational space, as well as the integration of the person into the system of world culture. Based on it, regional and national-regional educational programs are developed. The regional and national-regional components of the standard determine the standards within the competence of educational institutions of certain regions, territories and republics of the states. They provide the specific needs and interests of the population of a certain region in the field of education, which reflects the uniqueness of the culture of the peoples living in the region[1].

If we look at the world, in connection with the Republic of Tatarstan, it should be noted that the majority of the population in this region are representatives of the Tatar and Russian peoples, so the development prospects of Tatarstan are directly related to the state of inter-ethnic harmony; development of ethnic and multi-ethnic culture. The stability of international relations depends on the extent to which the rights and freedoms of all peoples living in the region are ensured. At the

same time, the formation of tolerance, patriotism, and internationalism in primary classes is important.

In the regional educational space of Tatarstan, one of the leading directions that help to form the ethnic and multi-ethnic culture of schoolchildren should be music education, taking into account the uniqueness of the musical culture of the region[9].



Our Uzbekistan is also a multinational nation. Famous Tatar writer, scientist and enlightener **Kayum Nasiri**[25] (pseudonym; real name Gabdulqayum Gabdenosirovich Nosirov) [1825.2(14). 2, Zelenodolsk district of present-day Tatarstan - 1902.20.8(2.9): "*How many languages do you know, how many times you are human.*" In our opinion, this statement can also be related to the concept of "musical culture", knowing the musical culture of different nations enriches the human soul and enriches his life spiritually.

As it is known, after the independence of Uzbekistan[23], the task of spiritual restoration of the society was set, and the art of music is helping it as a way of educating the young generation in the spirit of humanity[22] and tolerance culture[21] to the cultural values[24] of different peoples and of special importance for the whole world community. Aesthetic education, especially musical education, is today the priority direction of forming the personal qualities of students.

Humanism – is a concept that expresses concern for human dignity, freedom, happiness, equal rights, creating conditions for the manifestation of all the principles of humanity. According to him, the most valuable thing in the world is a person, the whole being should serve a person and his happiness. Caring about human destiny, people's interests, people of the country.

Humanism - the humanistic idea of education is an important concept in which the destiny of a person or person lies. The idea of humanity is an eternal value of every nation, it is a universal value. For example, during the years of the Second World War, the humanitarianism, childishness, patriotism and kindness of the Uzbek people to the people of different nationalities is an example. Since the person is at the center of education, every believer should strive to become a perfect person, only then we can achieve the expected result. In the works of **Rayhon Beruni, Abu Ali ibn Sina, Mirza Ulugbek, Alisher Navoi**, and others, the ideas of "Humanity", human freedom, and his dignity were put forward. Farobi tried to prove that friendly and friendly living of people in the country would bring great benefits to the peoples, and strongly encouraged peace and focused all his activities on the service of people. Navoi made caring about human fate, people's interest, and country his main issue. He put forward the idea that the most valuable thing in the world is a person. In his opinion, the whole being should serve man and his happiness. World religions, including Islam, embody the ideas of humanitarianism. In it, it is called to help the poor, the poor, the foreigner, the needy, to be generous and honest[5].

Humane ethics - Humanistic ethics. The secular practical orientation of the complex of new humanitarian sciences was especially evident in the philosophy of ethics. Humanists gave such an important place to moral issues in the formation of a new worldview and the ideal of a perfect person that none of them neglected the issues of moral philosophy in their work. Humanists were encouraged to do this for other reasons, particularly by the constant stream of moral and didactic literature of the traditional type - the very standard, monotonous Triumphs of Virtue, Flowers of Piety, Fruits of Virtue, Manners, etc. These works were written by both learned theologians and very modestly educated monks and scholars. The main purpose of this literature is to promote the moral teaching of the Church, in which religious virtues - faith, hope, love - are put in the first place and confirm the principles of humility, patience, mercy, suppressing the "excessive" claims of the mind. and human will, to the apologetics of ascetic ideals. Church literature of this type, as a rule, was created in Volgar and was widespread in Italian society in the 14th and 15th centuries. Often, he repeated and explained the postulates of the moral sermons that sounded from the pulpits of the church, but he also reflected the views of informal preachers - wandering monks infected with

heretical ideas. In moral and didactic works, the positions of the church and its flock are often different. This is confirmed, in particular, by commercial literature, which has its own pragmatic, common sense approach to the official interpretation of Christian ethics.

Humanists took their own special path, wanting to establish secular moral principles that did not violate Christianity, but focused on the problems of human existence on earth - they did not accept many goals from the arsenal of church doctrine. or from the general norms of life practices of different social strata. They were not satisfied, for example, with the noble ideals of noble origin as the foundation of human nobility, but they also did not condone extensive immorality. Based on the ancient heritage, humanistic ethics took into account the traditions of medieval moral philosophy, which clearly responded to the needs of its time, especially in the formulation of problems. The moral thought developed by the humanists became a solid foundation of the worldview of the Renaissance. It is closely related to the economic and socio-political, anthropological, aesthetic and other ideas of the Italian Renaissance, and to some extent influenced the unique position of the church, encouraging it to respond more appropriately to the requirements of the time.

During the **Quattrocento** period in Italian humanistic ethics, several trends developed that differed in their philosophical foundations and in their main problems - the understanding of the highest good, the moral ideal, and the interpretation of the relationship between the individual and society[12].

The beginning of the XIV-XV centuries. In Florence, moral problems were marked by the emergence of "civic humanism" (term of G. Baron, USA), which was closely connected with socio-political thinking. This direction in humanism, which appeared in the works of Salutati, took concrete forms in the works of **Leonardo Bruni Aretino**, **Matteo Palmieri** and other humanists. The ideas put forward by them received wide public attention not only in Florence, but also in Milan, Venice and Rome[4].

Italian humanist, writer and historian of the **Renaissance Leonardo Bruni Aretino**[11] (1374 - 1444) **Coluccio Salutati**[17] (1331-1406), one of the founders of Italian humanism of the Renaissance (Renaissance) and **Manuel Chrysolorus**[14] (1355-1415), a Byzantine Greek scholar and the first to introduce Greek literature to Western Europe)'s student, from whom he learned the Greek language perfectly. As a young man he served in the Roman Curia, and in the last seventeen years of his life he was chancellor of the Florentine Republic, whose system he admired. Bruni's main works are also dedicated to him - "In praise of the city of Florence" (beginning of the 15th century), "On the State of Florence" (mid-30s), Signoria "History of the Florentine People".



Leonardo Bruni



***Lino Coluccio
Salutati***



Manuel Chrysoloras

Bruni greatly appreciated ancient authors. He translated a lot of Plato, Aristotle, Plutarch, Demosthenes from Greek to Latin, and strove for the classicism of his language. He sharply criticized the medieval translations of Aristotle for the imperfection of the language that distorted the meaning of Stagirite philosophy. He dealt with the problems of ethics, to which he dedicated "Introduction to the Science of Ethics", "Dialogues to Peter Paul Histrius" (humanist Pietro Paolo Vergerio), a number of speeches and letters.

In his moral and political concept, Bruni started from the thesis of ancient philosophy that man is a social being who reveals himself most fully in interaction with other people. The humanist's special attention to the problem of the relationship between the individual and the society comes from this. Bruni solves this in one way: social harmony requires subordinating personal interest to the common good. He considered the best state system to be a republic based on the principles of freedom, equality and justice. In everyday political practice, according to Bruni, they are established only when all citizens respect the laws of the state, and magistrates strictly control their implementation and suppress the will of particularly powerful individuals. The moral behavior of the individual and various social groups should be based on the interests of the whole society - this is the leitmotif of Bruni's moral teaching, and later the whole direction of civic humanism[2].

Bruni saw in the Florentine Republic the best form of a state that historically developed in the confrontation of various social forces. His laws, in his opinion, ensured the freedom of citizens from tyranny and foreign slavery, equality in political rights and justice as the norm for the distribution of public property. At the same time, Bruni certainly spoke of full citizens belonging to the twenty-first guild of Florence. He put aside the fact that they make up a small part of the city's population. Bruni praised the Florentine Republic's "Institutions of Justice" and other laws that strengthened its political and legal system, the Popolan democracy. "All our laws," he wrote in 1413, "are aimed only at ensuring the equality of citizens, because true freedom is based only on equality. Therefore, we exclude the most powerful families from the government, so that they do not become too dangerous because of the possession of state power. Bruni interpreted the concept of equality in the spirit of Aristotelian ideas - it means equal responsibility of all citizens before the law and equal rights to participate in state management. Of course, as an astute politician, Bruni clearly saw the differences between real life and the idealized image of Florence that he glorified in his early works. Sympathizing with the middle classes of the people, whose highest positions in the republic had become practically unsupportable, he bitterly noted in his treatise On the Florentine State that, despite the previous electoral system and the short-term nature of the positions, the real power in Florence remained in the "noble and wealthy gathered in his hands. However, Bruni remained deeply devoted to Florence until the end of his life and considered patriotism (local, even urban in Italian contexts) to be an important moral standard[7].

His patriotic position did not differ from the public sentiments of his compatriots. Florentines had a duty to serve the "local commune", the city-republic in the economic, political and military spheres, and these ideas became an important principle of Bruni's secular civic ethics, and then one of its main postulates. the whole direction of civic humanism.

Bruni's ideas were widely developed in the works of **Matteo Palmieri**[15] (1406 - 1475), a prominent Florentine humanist and political figure, an Italian humanist born into a family of Florentine pharmacists. In his essay "Civil Life" (circa 1439), Palmieri describes a detailed moral and social doctrine based on the principles of serving the common good and benefiting the state. To achieve this, "everyone must be willing to face challenges and put themselves at risk." True virtue, according to the humanist, is work for not only personal, but most importantly, social welfare. The entire working-age population should be engaged in useful activities, taxes should not be destructive, because according to Palmieri, individual wealth is the key to the well-being of society as a whole. Like many humanists of his time, Palmieri does not condemn the foundation if it is done with "clean hands". Wealth, in his opinion, makes it possible to widely display the virtues of citizenship - such qualities as courage, generosity, generosity, patriotism. Rejecting the principles of ascetic morality and the apologetics of solitary life focused on religious contemplation, Palmieri writes passionately about the advantages of civilization, the values of material and spiritual culture created by the joint efforts of all people. According to Palmieri, the active activity of a human citizen, filled with work, creativity and concern for the common good, is



the duty of everyone living in society. As for the best form of state to help realize this moral ideal, in Palmieri's humanistic ethics, like Bruni's, it is embodied in the Florentine model of the Popolan republic[6].

The concept of civic philanthropy developed enthusiastically in Florence in the first half of the fifteenth century. Famous humanists - Florentine humanist, statesman and orator, representative of the Renaissance **Giannozzo Manetti**[13] (1396-1459), prominent Italian humanist, writer, collector of ancient manuscripts, **Poggio**



Bracciolini[10] (1380-1459), whose manuscripts formed the basis of the Latin Roman style, and others contributed. Later, in the 1970s and 1980s, it underwent some changes under the tyrannical Medici regime. A passionate supporter of the ideas of civic humanism, the famous Florentine statesman **Alamanno Rinuccini**[16] (1426 - 1499) took a new step in understanding this secular morality in his Discourse on Liberty (1479). more closely related to the problems of the organization of the political system. One of the central concepts in his work was the



freedom of the citizen. A staunch republican, an ardent opponent of the Medici tyranny (for which he paid with his political activity), Rinucci considered freedom the most important and indispensable condition for the spiritual advancement of the individual and society. In the interpretation of Bruni and Palmieri, equality and justice, which he is close to, appear in his morality as a norm of social life, which is impossible in the conditions of the violation of the democratic system of elections to judges and the lack of transparency in deliberation. important state affairs. This happened in the last decades of the 15th century in Florence under the power of the Medici House. Rinuccini's conclusion is that the corrective moral ideal of civil humanism: political freedom drastically reduces the possibility of an active public life of citizens, if it is expressed by the tyrant and his entourage, it calls into question the principle of serving the state; In such conditions, dignity and morals can be preserved only by staying away from political activities, entering the seclusion of creative work and doing just that, benefiting society. In the humanist conception, freedom becomes the highest moral category, perhaps the basic virtue that every human being should strive for[3].



In Florentine civil humanism, considerations of secular moral principles and socio-political order were interrelated. He confirmed not only the value of life on earth, which depends on the efforts of people, but also the ideal of a strong-willed, motivated, intelligent person who is conscious in life and ready to participate responsibly in society and state affairs.

Conclusion.

Humanistic ethics, or humanitarianism, is an ethical approach that places great importance on the plight of people everywhere, without distinction. This doctrine assumes that human needs are fundamentally the same and revolves around the protection of basic liberties within an economic system that serves the entire population rather than well-connected elite groups.

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Rezyume: Maqola Oliy ta'lim muassasasida ta'lim olayotgan talabalarni musiqa darslari orqali kompetensiyalarini rivojlantirish mavzusida bo'lib, unda: Musiqiy kompetentsiya, Shaxsning o'ziga xos xususiyati, O'quvchilarni milliy musiqaga muhabbat ruhida tarbiyalash hamda Insonparvarlik etikasi tahlil qilingan.

Резюме: В статье рассматривается тема развития компетентности студентов, обучающихся в высшем учебном заведении посредством уроков музыки, анализируются: музыкальная компетентность, личностные качества, воспитание студентов в духе любви к национальной музыке, гуманитарная этика.

Kalit so'zlar: Musiqa ta'limi, ta'lim tizimi, axloqiy va estetik tarbiya, ijtimoiy madaniyat, kompetentsiya, dolzarb, estetik kompetentsiya, musiqiy kompetentsiya, ustuvor vazifa, xususiyat, musiqiy ahamiyat, jamiyat, ma'naviy tiklash, estetik tsikl, musiqaga muhabbat, bolaning qalbi.

Ключевые слова: Музыкальное образование, система образования, нравственно-эстетическое воспитание, социальная культура, компетентность, течение, эстетическая компетентность, музыкальная компетентность, приоритетная задача, характеристика, музыкальная значимость, общество, духовное восстановление, эстетический цикл, любовь к музыке, детское сердце.

ARTIFICIAL INTELLIGENCE AND ITS ROLE IN HUMAN ACTIVITY

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Summary: *This article discusses the history of artificial intelligence systems, their role in human activity, the technology of artificial intelligence and the importance of implementing artificial intelligence systems.*

Keywords: *information and communication technologies, telecommunications, software, artificial intelligence.*

Usually, many people think of robots as assistants who can talk like humans and do all the work instead of them. But this is a relatively broad concept. In fact, applications on your mobile device: google-translator, dictionaries, various games, etc. are also clear examples of artificial intelligence. Only their coverage is smaller and they can only help you in a certain direction. That is, depending on the type of actions you want to perform, you use the appropriate program.

What is artificial intelligence?

Artificial intelligence is a special field of computer science, which deals with the creation of computer systems with the capabilities usually associated with the human mind: language understanding, teaching, discussion, problem solving, translation, and similar capabilities.

Currently, artificial intelligence consists of algorithms and software systems designed to perform various actions, and it can cope with several tasks that the human mind can perform.

In the 1990s, a new page was opened in the development of artificial intelligence. In 1997, an IBM computer named Deep Blue became the first computer in history to defeat world chess champion Garry Kasparov.

Another bright example of artificial intelligence is the IBM Watson supercomputer, which answers questions in a specific language based on its database. Also, programs such as Siri, a mobile assistant that has become a constant companion of many, and Prisma, a photo processor, can be noted as one of the achievements of Artificial Intelligence.

By now, artificial intelligence has become widely popular and covers almost all aspects of our daily life. For example, residents of the Chinese city of Incheon do not need bank cards. All processes related to calculations are carried out by artificial intelligence by clarifying the image of a person's face. Benefit or harm? The debate about artificial intelligence has been going on for almost 50 years. Experts have not yet come to a conclusion. Some worry that mass unemployment could rise as a result of their growing popularity.

Another group of experts insists that artificial intelligence should be treated positively. Even among IT billionaires, there are different views. In particular, the founder of SpaceX, Elon Musk, is confident that artificial intelligence will destroy the entire civilization. According to Musk, "Artificial intelligence is the main threat to human civilization. artificial intelligence will cause massive labor problems. The reason is that robots can do everything better than us. In the pursuit of cutting-edge technology, companies can lose sight of the dangers posed by AI".

Also, the head of Microsoft, Bill Gates, will touch on its damage. "A few decades from now, when robots start doing most of the work, AI will become so powerful that it will eventually start to worry us. I agree with Elon Musk in this regard. But I can't understand why this question does not concern others," says Gates.

It is not surprising that by "others" Gates meant Mark Zuckerberg, the owner of Facebook. Because Mark expressed his positive attitude towards artificial intelligence: "New technologies can always be created for good or evil. We will see the positive result of the wide spread of artificial intelligence in the next 5-10 years," he said, objecting to Elon Musk's opinion.

Today, in some countries, the use of robot-nurses, driverless vehicles, and the service of drones delivering orders has been established. Even some tasks of police officers are performed by

special robots. Scientists are trying to make their appearance as human as possible. In addition, artificial intelligence has already become a constant assistant of journalists. For example, robots "working" at the Associated Press write financial reports. The use of artificial intelligence has increased the number of news items in this publication from 300 to 4,400 each quarter.

According to Swiss Re insurance company, 4.7 million people may be unemployed by 2020. It was also said that unemployment could threaten treasurers, postal workers, accountants and office workers. Artificial intelligence can easily perform their tasks.

8 facts about artificial intelligence Artificial intelligence is a special field of computer science, which is the development of computer systems with capabilities usually associated with the human mind: language understanding, teaching, discussion, problem solving, translation, and similar capabilities. creates.

Although scientists are eager to experiment with artificial intelligence (AI), many people are wary of the phenomenon. Even Tesla CEO Elon Musk has called it a "major threat" to humanity and a possible source of war and unemployment.

Let's take a look at 8 interesting facts about artificial intelligence.

Fact 1. The service of artificial intelligence is not limited by time standards.

Fact 2. It can adapt to disturbances American scientists have experimented with a robot equipped with artificial intelligence. They found that it will continue to work even if it is seriously damaged. During the experiment, the "injured" robot was able to adapt to at least six different injuries, including the complete loss of two lower limbs, and the robot "arm" was able to adapt to at least 14 types of injuries, including the failure of two of its engines took

Fact 3: Artificial Intelligence Inherits Creators' Beliefs and Stereotypes An artificial brain draws its conclusions based on the information it is initially fed, so it is characterized by racial and gender prejudices. Studies have shown that some computer facial recognition systems have confused the gender of black women 35% of the time and only 0.8% of white men. This is due to the fact that 75% of the photos in the databases used by artificial intelligence are men, and 80% of them are white.

Fact 4. Artificial intelligence can answer questions To date, the most powerful artificial intelligence-powered text generator - GPT-2 from OpenAI can write entire paragraphs without making mistakes. At the same time, the system will answer questions correctly if they are related to general knowledge.

Fact 5. Artificial intelligence can learn everything a human can do Researchers hope that by 2060 artificial intelligence will be able to perform almost all human tasks independently.

For example, Oxford University scientists in collaboration with Google's DeepMind Artificial Intelligence department taught the system to read lips better than humans. Watch, Attend and Spell detects the difference between words with similar lip movements and analyzes up to 50% silent speech. For lip readers, the same figure is only 12%. The system was trained by watching BBC news programs. Watch, participate, and spell over 17,500 words after learning 118,000 sentences from the video.

Fact 6. Robots with artificial intelligence already work as announcers, fly into space, patrol ships and play football. A robotic announcer reads the news at China's state news agency Xinhua. It is based on the life-like prototype of Zhang Wanwei. The robot can not only read news texts, but also learn from its human counterparts by imitating their facial expressions and speech patterns. The CIMON 2 robot communicates with astronauts on the ISS: it uses the Watson IBM system as its artificial intelligence. An update with the Watson Tone Analyzer service allows CIMON 2 to understand and respond to people's emotions. The CIMON project was developed by the German Aerospace Center in cooperation with Airbus and IBM. Norwegian oil company Aker BP uses a robot dog called Spot (developed by Boston Dynamics) to guard one of its vessels. Modern robots even know how to play football: such models were created in the artificial intelligence group at the Free University of Berlin.

Fact 7: Artificial intelligence helps fight the coronavirus Around the world, artificial intelligence-based systems help track infected people, collect information about the virus and search for a vaccine. For example, the Israeli company Vocalis Health, in cooperation with the Israeli government, has developed a technology for detecting the disease of COVID-19 based on sound spectrum analysis. In addition, artificial intelligence robots are used to patrol public spaces (Singapore). Using the Megvii ReID technology, a system has been developed in China to identify people with high fever in the human stream.

Fact 8. Artificial intelligence is saving the planet and providing people with food.

NatureServe, a non-profit organization dedicated to raising awareness of biodiversity conservation in the United States, Canada and Latin America, has partnered with analytics company SAS as part of the global Data for Good initiative. Artificial intelligence is used to collect information about plant and animal species, to determine their location and concentration of populations. The Food and Agriculture Organization of the United Nations (FAO) also recognizes the advantages of artificial intelligence: they "intelligence" information about weather conditions, pests, soil moisture and other important indicators taking into account, they believe that it will allow farmers to plan work more effectively.

It is no exaggeration to say that the above-mentioned fields of artificial intelligence are important areas of human activity today. Artificial intelligence is widely used not only in the listed fields, but also in other areas and fields. In conclusion, artificial intelligence has a great role in society, industry, science and human life.

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Rezyume: *Ushbu maqolada sun'iy intellekt tizimlarining tarixi, ularning inson faoliyatidagi roli, sun'iy intellekt texnologiyasi va sun'iy intellekt tizimlarini joriy etishning ahamiyati haqida muhokama qilinadi.*

Резюме: *В данной статье рассматривается история роли систем искусственного интеллекта, важность технологий искусственного интеллекта и внедрение систем искусственного интеллекта.*

Kalit so'zlar: *axborot-kommunikatsiya texnologiyalari, telekommunikatsiya, dasturiy ta'minot, sun'iy intellekt.*

Ключевые слова: *информационно-коммуникационные технологии, телекоммуникации, снабжение, искусственный интеллект.*

**CARTOGRAPHIC AND GEODETIC STUDIES OF THE TERRITORY OF
KARAKALPAKSTAN DURING THE COLONIAL PERIOD**

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Summary: *These studies are due to the fact that the period under consideration is characterized by the beginning and subsequent systematic study of the nature of Karakalpakstan, the results of which acquired important scientific and practical significance. Despite some outstanding achievements in the geographical knowledge of Karakalpakstan, the pre-revolutionary period gave only the basic outlines of geographical ideas in the country. This was the initial stage that followed the first path in the study of Karakalpakstan, which, however, laid the foundation for the subsequent purposeful and systematic study of the nature and natural resources of the territory.*

Keywords: *plateau, delta, productive forces, natural sciences, anthropology, ethnography, geology, geographical society, expedition, dendrology, zoogeography, botany, cartography, landscape, habitat.*

Introduction. Geographical exploration of the territory of modern Karakalpakstan entered a new phase in the second half of the 19th century, from the time of its annexation to Russia.

The Republic of Karakalpakstan is located in the northern part of Central Asia at the junction of two vast deserts - Kyzylkum and Karakum, in the lower reaches of the Amudarya. It occupies the north-western part of the Kyzylkum desert, the Ustyurt plateau's south-eastern corner, the Aral Sea's southern part and the Amudarya delta [3].

In the increasing development of the productive forces of Turkestan after its annexation to Russia, Russian scientists played a large role, many of whom were carriers of the ideas of advanced science and social thought.

Research by Russian scientists has established that Central Asia, including the territory of Karakalpakstan, has enormous natural productive forces - fertile soils, mighty rivers (Amudarya and Syrdarya), one of the largest lakes, the Aral Sea, unique flora and fauna.

Since the 60s of the XIX century systematic exploration of the Trans-Caspian territories began. A great contribution to the study of the nature of Karakalpakstan, its geographical conditions and natural resources was made by such outstanding researchers as A.I. Butakov, N.A. Severtsev, I.G. Stoletov, A.A. Tillo, F.B. Dorandt, S. M. Smirnov, N. P. Barbeau de Marni, V. I. Massalsky, A. D. Arkhangelsky, A. I. Glukhovskoy, N. N. Zubov, A. V. Kaulbars, F. F. Berg, H.V.Gelman, L.E.Gedroyts, I.V.Mushketov, L.S.Berg, as well as large teams of other scientists as part of expeditions of the Resettlement Directorate of the Ministry of Agriculture, in soil-botanical and hydrological studies of various government departments. The Russian Geographical Society and its local departments played a major role in this. Moscow Society of Lovers of Natural History, Anthropology and Ethnography, which created favourable conditions for organizing systematic, including stationary, research into the territory of Central Asia, including Karakalpakstan.

Until the second half of the 19th century, there was no new information about the Aral Sea in comparison with what was already available. Only in 1825, the topographic expedition of Colonel F.F.Berg visited the western coast of the sea. In 1840-1847 topographic surveys and astronomical determinations of individual sections of the Aral Sea coast were carried out.

Main part. The Aral Sea before A.I.Butakov was depicted on maps based on reconnaissance materials, and only in some places based on instrumental topographic surveys. However, the results of individual surveys were not brought together; they were carried out separately. This led to the fact that mapping the outlines of the Aral Sea turned out to be imperfect due to systematic level fluctuations. For example, according to surveys in 1825, the water level of the Aral Sea was minimal, in 1860 it was maximum, in 1880 it was minimal, and at the beginning of the 20th century rose 3 m. Therefore, its numerous islands were not included on the map.

Cartographic surveys of the territory of Karakalpakstan took place in three directions; a) the floodplain and river delta of Amudarya, b) the Kyzylkum desert, and c) the Ustyurt plateau. Cartographic material is also distributed following this. All the first work in this direction concerns mainly the floodplain and river delta. The Amudarya, as a region of high agricultural culture, only incidentally affects the territory of Kyzylkum and Ustyurt [3].

The beginning of topographic survey work on the territory of present-day Karakalpakstan dates back to the existence of the Khiva Khanate.

The first works that have come down to us can be considered the route surveys of Muravin (1740-1743). Then, under the leadership of A.I. Butakov in 1848-1840 surveys were taken of the Aral Sea and the Amudarya delta ("Flat map of the southern shore of the Aral Sea and the Amudarya branch") on a ten-verst scale [2].

Based on Butakov's materials, a complete map of the Aral Sea was compiled on a scale of 1:606 665. It was carried out on the instructions of the Hydrogeological Department of the Main Admiralty in 1850, but these maps are outdated, especially for the southern coast of the Aral Sea, where a lot has changed.

A visual survey of the Amudarya current on a five-verst scale was carried out in 1858 by Ignatiev. This map gave fairly accurate ideas for that time about the lower reaches of the Amudarya up to approximately the 42nd parallel.

Since the 70s of the XIX century, the cartographic study of present-day Karakalpakstan has advanced significantly. Many expeditions under the general name "Amudarya" conducted numerous surveys, reconnaissance and astronomical determinations, which made it possible to compile a more accurate overview map, which included all materials from 1842 to 1872 inclusively. This is a map of part of the Turkmenistan Military District on a scale of 10 versts per inch. In 1873, a summary map compiled by A.V.Kaulbars appeared [1].

In 1876-1877 The Urundarya expedition led by N. G. Petrusevich provided a new plan for the lower reaches of the Amudarya. At the same time, the Department of Military Topographers is conducting instrumental surveys of the southeastern coast of the Aral Sea and the eastern part of Kyzylkum [3].

Leveling work was carried out by A.N.Glukhovsky in the same zone over a total length of 5620 km. And filming work on an area of 3.7 million hectares. But these materials have been completely lost.

Since 1887, continuous surveys of the corps of military topographers on a two-verst scale began in the lower reaches of the Amudarya. This was the first expedition, most fully equipped with everything necessary for work. However, the ten-verst map of the lower reaches of the Amudarya, compiled by military topographers, retained the same shortcomings as its predecessors.

In 1889-1890 military topographers compiled a 40-verst map of the southern border strip of Asian Russia and a 20-verst special map of Turkestan. The latter was somewhat corrected in part of Karakalpakstan in 1893. The outlines of the western shore of the Aral Sea, the longitudinal position of the Barsa-Kelmes mud, and the southern cliff of Ustyurt, where the discrepancies with existing maps reached 10-15 km, were especially corrected. The indicators of the floodplain of the Amudarya delta had even more dramatic discrepancies.

In 1912, workers of the Resettlement Department of the Ministry of Agriculture, together with the Amudarya Department, carried out a horizontal survey of the entire territory of Karakalpakstan with the exception of the Kungrad region. Based on survey materials, in 1914 an eight-verst "Map of Land Use of the Native Population of the Amudarya Department" was published. The map was published as a supplement to the works of the Resettlement Administration.

The work of the Land Improvement Department of the Ministry of Agriculture deserves special attention. In 1913-1917 survey parties of the Regional Land Administration under the leadership of the lower. N.V.Mastitsky and V.V.Tsinzerling examined the entire irrigated and irrigable zone of Karakalpakstan and part of the desert-pasture zone (Tamdy region). From 1913 to

1915 under the leadership of Mastitsky, a triangulation network of 140 points was built on an area of approximately 6.2 thousand hectares along the left bank of the Amudarya, including the entire Khodjeli and part of the Kipchak district. A total of 3345 km were covered by leveling. A vertical-horizontal scale survey was carried out on a one-verst scale on an area of 424 thousand hectares, and a detailed scale survey on a scale of 1:4200 was carried out near Jumurtau, Kipchak and Takhiatash on a total area of 10600 hectares.

During the same period (1913-1915), under the leadership of engineer V.V.Tsinzerling carried out work on the right bank of the Amudarya. In the Shorakhan area, covering the current Beruni and Turtkul regions (their full part, the lands of ancient irrigation and part of the Kyzylkum sands), leveling was carried out along the Tashsaka-Turtkul-Shabbas line to the Sultan-Uiztag ridge. 36 stone benchmarks were installed, and a plan of irrigated land on a two-verst scale was drawn up. 1113 km were leveled in this section [3].

In the Chimbay area (entirely covering the current Kegeyli, Chimbay, most of the Muynak and mainly Takhtakupir districts) work was carried out on an area of 800 thousand hectares; a polygonometric network with a total length of 2056 km was built, 4260 km were leveled, lines were drawn up along all the most important channels and ditches. Reconnaissance surveys of the Amudarya spill and its channels Taldyk, Akdarya, Kantuzyak, and Kazakhdarya were carried out, reconnaissance surveys were also carried out with route surveys and barometric leveling in the following directions; a) Chimbaykol-Baymurat-Kazalinsk, b) Chimbaykol-Baymurat-Kzyl-Orda, c) Daukara-Sultan-Uizdang, d) Turtkul-Tukantau-Aktau, Tamdy-Bukhara.

Despite the fact that the materials of the extensive works of the Land Administration are of undoubted value, they have not been completely summarized.

To complete the review of pre-revolutionary cartographic research, we should also dwell on astronomical and leveling work.

Astronomical observations on the territory of Karakalpakstan were carried out by many expeditions. The largest number of astronomical points was organized by the Corps of Military Topographers and the Russian Geographical Society. A total of 69 points were identified. The longitudes of all points, except for the New Nicholas Cathedral in Petro-Alexandrovsk, were determined chronometrically. Repeated determinations at the same points by different persons often result in some discrepancies, for example, two determinations within the city of Chimbay. Similar discrepancies are given by items taken from the Blaramberg catalogue and other sources. These facts indicate that the readings of the astronomical points of Karakalpakstan require a very careful attitude, since the old points are unknown, and later determinations are made in other places [4].

Of the subsequent leveling works, the instrumental leveling done by the Ryazan-Ural Railway Company along the lines deserves attention;

- A) Uralsk-Uil-Ustyurt-Kungrad,
- B) Topolinskaya-Kungrad.

In 1913, surveys were carried out on the planned line of the Aleksandrov-Gai-Kungrad Khiva-Chardzhou railway. In 1914, N.V.Mastitsky carried out leveling twice along the bank of the Amudarya from the precision leveling mark and the military topographic department at the station Chardzhou Central Asian Railway.

The last leveling is important. All subsequent leveling by Mastitsky are based on it, from which two benchmarks and one stamp remain (in Tashsak, Kimchak and Turtkul).

Thus, in the pre-revolutionary period, it was possible to take large-scale surveys of the floodplain and delta of the Amudarya on an area of approximately 19700 km²; first approximation surveys (5 versts per inch) covered the territory of the Tamdy region on an area of 37400 km², Ustyurt - 13600 km². A total of 70700 km² or 34.3% of the entire territory was covered by surveying.

As already noted, A.I.Butakov made a great contribution to the expansion of cartographic ideas about the Aral Sea.

The first expedition of A.I.Butakov pursued the goal of giving a general reconnaissance of the entire Aral Sea, checking the depth in different directions, determining the latitudes of many places, taking photographs of the Barsa-Kelmes island, and filming groups of islands. Finally, the expedition discovered completely new islands, calling them the "Royal Islands."

A.I.Butakov made the first observations on determining longitude and magnetic compass deviations on the Aral Sea. The expedition led by A. M.Butakov reached Tokmakata where K.E.Pospelov made a marine survey, A.A.Akishev did reconnaissance sounding, which allowed us to come to the correct conclusion that Tokmakata (Muynak) is connected by a sandbank to the mainland and is a peninsula, A.A.Akishev found a lot of mouths using a compass and made a survey, carried out astronomical observations, determined geographical coordinates and established that the southern coast of the Aral Sea starts from Tokmakata. Small low-lying islands were discovered approximately in the middle of the Aral Sea. This is the first geographical discovery of the expedition. The islands on the map were named after General V.A.Obruchev.

Adverse weather conditions did not make it possible to explore the eastern shore of the Aral Sea, so A.I.Butakov changed the route, heading diagonally to the northwest of the sea.

On the island of Barsa-Kelmes, he organized work to determine geographical coordinates. The instrumental survey was carried out on the northern and eastern shores of the islands: Kugural, Barsa-Kelmes, Nikolai, Bellingshausen, Lazarev, etc. Only the western part of the coast was measured by eye.

In 1849, A.I.Butakov carried out repeated surveys and measurements of the sea, based on which an accurate map was compiled.

In 1873-1874 The Amudarya Delta was again explored in detail and accurately mapped by the joint efforts of A.V.Kaulbars, F.B.Dorandt and N.N.Zubov. This was especially necessary since before that there were only approximate and schematic plans for the distribution of the delta's channels according to the stories of travellers (A.I.Butakov, G.I.Danilevsky, Y.V.Khanykov, etc.) [2].

In 1874, A.A.Tillo was involved in leveling water levels in the Amudarya. He tried to find out the possibility of passing the water of this river through the dry bed of the Uzboy into the Caspian Sea. For these purposes, in difficult conditions of summer heat and impassability, from July to September 1874, he leveled the Ustyurt plateau and found that the level of the Aral Sea was 74 m higher than the Caspian Sea level. However, with repeated, more accurate leveling, the difference between the result obtained later L.S.Berg and him turned out to be 0.5 m away.

The research of A.A.Tillo completed the cartographic work begun by A.I.Butakov and created the main contours of cartographic ideas about the Aral Sea.

In 1890-1891 A topographic survey of the Amudarya delta was again carried out, and maps were published in Tashkent in 1905. Several fragmentary information about changes in the delta's channels was reported by K.G.Girshfeld in 1900 ("Izvestia Turk. Department of the Russian Geographical Society, vol. II).

Much cartographic work in the lower reaches of the Amudarya was carried out by the Main Directorate of Land Management and Agriculture under the general leadership of N.A.Dimo (1912). His reports give a general idea of the areas surveyed with detailed characteristics of the soil cover.

Conclusion. In the pre-revolutionary period, cartographic and geodetic research was mainly of a route nature, with a certain practical orientation. During the Soviet years, cartographic work was carried out much more widely and was more purposeful, mainly for agricultural purposes. As a result, a relatively reliable basis was created for the compilation of a systematic and updated hypometric map for Kyzylkum and Ustyurt. A network of weather stations and hydro-meteorological posts was created, experimental sites were organized to study soils and vegetation, etc.

In addition, mapping of previously inaccessible areas was carried out, and many theoretical and practical issues related to the cartographic study of the entire complex of the natural environment of Karakalpakstan were clarified.

Thus, as a result of the work carried out, the general level of cartographic ideas about the regions of the Aral Sea and the lower reaches of the Amudarya created a reliable basis for comprehensive geographical studies of these territories and a scientific assessment of the natural capabilities and resources of the region.

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Rezyume: *Bu tadqiqotlar ko'rib chiqilayotgan davr Qoraqalpog'iston tabiatining boshlanishi va keyinchalik tizimli o'rganilishi bilan tavsiflanganligi, natijalari muhim ilmiy-amaliy ahamiyatga ega bo'lganligi bilan bog'liq. Qoraqalpog'istonning geografik bilimlaridagi ba'zi ajoyib yutuqlarga qaramay, inqilobdan oldingi davrda mamlakatdagi geografik g'oyalarning faqat asosiy konturlari berilgan. Bu Qoraqalpog'istonni o'rganishda birinchi yo'lni bosib o'tgan dastlabki bosqich bo'lsa-da, keyinchalik hudud tabiati va tabiiy resurslarini maqsadli va tizimli o'rganishga asos soldi.*

Резюме: *Данные исследования обусловлены тем, что рассматриваемый период характеризуется началом и последующим систематическим изучением природы Каракалпакстана, результаты которого приобрели важное научное и практическое значение. Несмотря на некоторые выдающиеся достижения в географическом познании Каракалпакстана, дореволюционный период дал лишь основные очертания географических представлений в стране. Это был начальный этап, по которому следовал первый путь в изучении Каракалпакстана, который, однако, заложил основу для последующего целенаправленного и систематического изучения природы и природных ресурсов территории.*

Kalit so'zlar: *plato, delta, ishlab chiqaruvchi kuchlar, tabiiy fanlar, antropologiya, etnografiya, geologiya, geografik jamiyat, ekspeditsiya, dendrologiya, zoogeografiya, botanika, kartografiya, landshaft, yashash muhiti.*

Ключевые слова: *плато, дельта, производительные силы, естествознание, антропология, этнография, геология, географическое общество, экспедиция, дендрология, зоогеография, ботаника, картография, ландшафт, среда обитания.*

UDK 551

**STUDY OF GEOMORPHOLOGICAL, GEOLOGICAL-LITHOLOGICAL,
HYDROGEOLOGICAL CONDITIONS, HYDRO-PHYSICAL, STRENGTH, AND
DEFORMATION PROPERTIES OF SOILS, AND SEISMICITY OF THE MUYNAK
AREA, MUYNAK DISTRICT, REPUBLIC OF KARAKALPAKSTAN**

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Summary: *The drilling of six boreholes up to a depth of 10 meters was carried out using a core drilling method with a UGB-IVC-50 type rig (diameter 180 mm) to determine the lithological structure of the strata and to collect monoliths for determining the physical-mechanical, deformation, and strength properties of the soils. Monoliths from the boreholes were collected using a soil sampler. Sampling, packaging, transportation, and storage of soil samples were performed in accordance with GOST 12071-2000. A comprehensive set of physical-mechanical properties of the soils was determined on the monoliths taken from the boreholes.*

Keywords: *site, research, soil properties, recharge. Relief*

The surface of the site during the survey period is uneven, with a slope from the northeast to the southwest. The surface elevation ranges from 57.70 to 58.60 meters.

Climate

The climatic characteristics of Muynak are provided based on data from the Muynak meteorological station, taken from KMK 2.01.01-94 and the Scientific-Applied Reference. The research area is characterized by a sharply continental climate, with significant daily and seasonal temperature fluctuations, low precipitation, and uneven distribution throughout the year. Summers are hot, winters are cold, with significant seasonal and daily temperature amplitudes. The hottest months are June, July, and August, while the coldest are from November to March.

The average annual air temperature is 10.2°C. The maximum temperature occurs in July (absolute maximum 43.5°C). The minimum temperature is noted in January (absolute minimum -29.2°C). The average number of days with a daily average temperature below 0°C is 104, and the number of days with a maximum air temperature is 6. The last spring frost was observed on February 19, 1987, and May 1, 1989, and the first autumn frost on October 10, 1998, and December 22, 1971. The maximum daily air temperature amplitude is 22.0°C in January and 23.7°C in July.

The average monthly relative humidity is 83% in the coldest month (January) and 57% in the hottest month (June). The average annual relative humidity is 70%. Snow cover is insignificant, averaging 6 cm, with an average of 27 days with snow cover per year (based on Muynak meteorological station data). The average annual precipitation, including snow and rain, is 113 mm. Most precipitation occurs during the cold period from October to May, with the highest average monthly precipitation (18 mm) observed in April.[1]

The maximum soil freezing depth is:

- 117 cm with a recurrence of 1 in 10 years;

- 138 cm with a recurrence of 1 in 50 years (Table 13 KMK 2.01.01-94, Karakalpakia meteorological station).

Wind

Winds blow in various directions throughout the year. During the cold period (January), northeast and east winds prevail with speeds of 4.7-4.8 m/s. The average monthly wind speed in January is 4.1 m/s, with a maximum of 4.8 m/s. During the warm period (July), north and northeast winds prevail (see Figure 1 - Wind Rose) with a speed of 4.8 m/s, the average monthly wind speed in July is 4.1 m/s, with a maximum of 4.8 m/s. The number of days with dust storms and blizzards per year is 57.

Hydrographic Network

The permanently flowing water artery of the area is the Amu Darya River (Ak Darya) and its small branch, the Kazak Darya River. Other ancient tributaries (Kunia Darya, Daryalyk, Akkayuz'yak) are periodically and seasonally flowing watercourses. Water appears in them for a short time during floods in some years. The depth of the dry riverbed incisions is 1.0-3.0 meters, and in some places, they are leveled and filled with sand. The average annual flow of the Amu Darya River within the studied area is 60-70 m³. [2]



Spring-Summer Hydrology

The hydrological conditions are influenced by spring-summer snowmelt and rainfall, with the river flow increasing significantly during this period. From November to March, the river is primarily fed by groundwater. During 2-3 months, the river experiences ice cover, with ice thickness reaching 0.5-1.0 meters. The formation of ice jams during ice breakup can cause water levels to rise, potentially leading to flooding and inundation of nearby areas.

Flooding results in the formation of numerous lakes in the region. Some of these lakes, lacking constant recharge from the river or its feeder streams, have dried up, while others are newly formed. Their sizes depend on the amount of incoming water. The largest are the Shchegol and Maipost lakes, covering an area of about 10 square kilometers. [3]

Geomorphological structure

The contemporary relief of the area is formed by a combination of endogenous and exogenous geomorphological processes. Two types of surfaces are distinguished based on genesis and morphology:

1. Structural-Denudation Uplift

- Located in the northern part of the study area, the structural-denudation uplift corresponds to the northern wing of the Muynak Peninsula anticline, presenting a tilted surface sloping southward. An erosional escarpment is well observed on the eastern part of the uplift.

2. Marine Accumulative Plain

- Found in the central and southern parts of the study area, this plain was recently covered by the sea. The entire area is covered with unevenly distributed sediments of Cretaceous and Quaternary ages. Throughout the Quaternary period, the area alternated between marine and continental conditions. [4]

Anthropogenic Load

Modern anthropogenic deposits are represented by reworked loams, sandy loams, and sands. Irrigational deposits also occur along canals, collectors, and ditches. These deposits range in thickness from 0.2 to 1.7 meters, and in some cases, reach up to 3.0 meters.

Geological structure of the area

The geological structure includes Cretaceous and Quaternary deposits:

- Cretaceous Deposits

- These form the structural-denudation uplift and are found at depths of 1.6 to 8.8 meters. The thickness of the Cretaceous deposits, according to the investigations of "Uzbekhydrogeology," exceeds 150 meters. On the northeastern part of the study area, near the erosional escarpment, Cretaceous deposits outcrop on the surface. To the southwest and south, Cretaceous outcrops form escarpments with a general dip toward the south.

- Quaternary Deposits

- These are alluvial formations (aQ4) widespread across the area, consisting of eolian sands, alluvial sands, and clays, overlaid by fill soils with a thickness of 1.0-1.3 meters. Based on Table B.25 of GOST 25100-2011, these soils are considered moderately saline. The dense residue of soluble salts ranges from 13,000 to 13,040 mg/kg, with Cl^- ions at 350 mg/kg and SO_4^{2-} ions at 8040-8160 mg/kg (Appendix 1.5).

Seismicity

The seismicity of Muynak, according to Amendment No. 1 (Appendix 1) to KMK 2.01.03-96, is evaluated at 6 (six) points (relative to Nukus).

Hydrogeological conditions

The conditions of recharge, formation, and circulation of groundwater are determined by the geological structure, composition of water-bearing rocks, modern physical-geographical features, and active human activity. The study area is part of the South Aral Artesian Basin, which comprises three aquifer levels: upper Pliocene-Quaternary, Jurassic-Paleogene, and Paleozoic. [5]

During the study period (February 2019), groundwater was encountered at depths of 3.8-4.7 meters from the surface. Long-term observations indicate that the minimum groundwater level occurs in April-May, and the maximum in July-August. The average annual amplitude of fluctuations is 1.0 meter. The dense residue of groundwater ranges from 1892 to 1911 mg/l.

The estimated maximum groundwater level, considering long-term observations, is expected to be 1.0 meter higher than the measured levels, i.e., at depths of 2.8-3.7 meters from the ground surface.

The following geological and engineering-geological processes are developed in the study area:

1. Seismicity;
2. Excessive moisture and partial waterlogging of land;
3. Soil salinization;
4. Groundwater flooding;
5. Deflation.

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Rezyume: Ushbu maqolada tibbiy xizmatlar ko'rsatishda shifokor va bemor o'rtasidagi shartnomaviy munosabatlar natijasida yuzaga keladigan munosabatlarning o'ziga xos xususiyatlari, tomonlarning huquq va majburiyatlari tahlil qilinadi.

Резюме: Ushbu maqolada olib borilgan tadqiqot maqsadi tahlil qilinadi: geomorfologik, geologik-litologik, gidrogeologik sharoitlarni, tuproqlarning suv-fizik, mustahkamlik va deformatsiya xususiyatlarini o'rganish, tuproq va er osti suvlarining betonga agressivlik darajasini baholash, shuningdek. saytning seysmikligini aniqlashtirish.

Kalit so'zlar: joy, tadqiqot, tuproq xossalari, oziqlanish..

Ключевые слова: участок, исследования, свойства почвы, питание.

IMPROVING THE QUALITIES AND METHODS OF AGILITY, STRENGTH OF YOUNG ATHLETES

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Summary: *The main factor determining the effectiveness of the training process in athletics is the speed in performing a competitive exercise, which integrally reflects the development of such physical qualities as speed, strength and its speed manifestation, i.e. the speed-strength readiness of the athlete. The article discusses the use of special exercises to increase the level of speed-strength readiness of track and field athletes aged 12–13 years.*

Key words: *Young athletes, speed-strength training, exercise sets.*

Relevance. The current level of development of athletics is characterized by the participation of previous children in intensive training and competitive activities. The constant increase in results in sports, first of all, increases the requirements for physical fitness young athletes. Currently, its high level is achieved due to a significant increase and increase in the duration of the educational process and especially the process of physical education specialties in the advanced stages of sports.

Analysis of literature data shows that this is a very urgent issue effective means and methods of developing qualities of speed and strength in the development and experimental justification of representatives of various sports, especially adolescents age, since at this age periods are observed the greatest biological increase in physical quality [1].

That is, they make it possible to take into account the age characteristics of athletes, maintaining their health, not requiring to spend extra time and at the same time provide increase in the level of physical fitness and, as a result, an increase in sports skills.

Athletics is associated with the efficiency of high-supplied special performance combined with the development rate of anaerobic capacity much higher aerobic capacity and efficiency recovery processes. Therefore, a special task physical education - increasing speed is a component of the physical activity of the athlete, and the means and methods of education should be aimed at the development of speed and speed-power (explosive) components motor movements.

The purpose of the study is speeding the training of 12-to 13-year-old track and field athletes.

Learning methods and organization. The pedagogical experiment was carried out on the basis of the "USUPES Nukus branch". The experiment involved 28 boys aged 12 to 13 in athletics. Control and an experimental group of 14 people each. The management team trained according to the standard training program "USUPES Nukus branch" for the primary sports specialty groups of the institution athletics. The experimental team studied our proposed methodology for strengthening youth speed athletes, which was based on the use of plyometric exercises.

The inclusion of plyometric exercises in your training process was carried out taking into account the youth of athletes. Simple Plyometrics are safer and require less equipment. These exercises were performed once or twice a week for six weeks and only then were more complex plyometric exercises.

Before starting the experiment, we tested the speed-strength training of 12-13-year-old track and field athletes. The results obtained made it possible to talk about the statistics Control Group (CG) and the uniformity of the experimental group (EG), that is, there were no significant differences in the indicators we studied.

The result at a distance of 300 meters in endurance running at a determined speed, there was an increase in indicators in both control and experimental groups, but they were not significant. This suggests that the training of young athletes during this period was not focused on developing speed endurance and the main focus was on developing speed and strength qualities.

Research results and their discussion. After completion, a final test was carried out during the study. Received results made it possible to say that young experimental group athletes during the study, the results were significantly improved in many control exercises (Table 1, 2).

Table 1 - indicators of speed and readiness for strength experimental group athletes

	Test exercise	Before the experiment	After the experiment	Increase (%)
1	30 m Run (seconds)	$4,65 \pm 0,23$	$4,44 \pm 0,09$	8,46
2	30 m Run (seconds)	$4,16 \pm 1,17$	$4,07 \pm 2,01$	6,36
3	Standing long jump (sm)	$201,4 \pm 1,6$	$208,7 \pm 1,9$	5,62
4	Jump up from one place (sm)	$44,67 \pm 2,56$	$48,03 \pm 2,79$	7,52
5	300 m Run (seconds)	$50,71 \pm 0,12$	$50,18 \pm 0,11$	9,25

As can be seen from Table 2, in the control group, the subjects had certain changes in the indicators under study, but they were not so important.

Table 2-speed-capacity readiness indicators athletes in the control group

	Test exercise	Before the experiment	After the experiment	Increase (%)
1	30 m Run (seconds)	$4,61 \pm 0,2$	$4,49 \pm 1,2$	2,6
2	30 m Run (seconds)	$4,1 \pm 1,23$	$4,06 \pm 1,07$	1,68
3	Standing long jump (sm)	$204,5 \pm 1,4$	$206,6 \pm 1,5$	2,23
4	Jump up from one place (sm)	$44,33 \pm 2,38$	$45,92 \pm 2,56$	4,58
5	300 m Run (seconds)	$50,59 \pm 0,11$	$50,43 \pm 0,10$	3,12

It should be noted that a significant increase in the results of jump control exercises (standing long jump, 96 standing jumps), which indicates an increase in the efficiency of explosive force and allows a rapid push from it leads to positive changes in the way of spacetime characteristics of the running structure steps.

This explains the positive dynamics of results in 30 runs meter (from the head and in motion). In addition, the improvement in running scores is 30 meters which is much more noticeable compared to running scores of 30 meters in motion. This is an indicator of the increase in explosive strength of athletes.

The results of jump control exercises had a positive effect on performance in speed tests. Thus, in the movement that determines the speed of running according to the 30 meter run distances and the speed qualities and indicators of the participants are determined significantly increased in the experimental group compared to the initial data ($P < 0.05$). This can be explained by the fact that in a special process the exercises include "explosive" jumps, exercises in which the plyometric (shock) method of execution is used.

For the progressive development of speed and speed-strength, it is necessary to use the qualities of young athletes separately training provides a variable method of "kick" optimal combination of jumping and running exercises. The effect of "new tracks" obtained as a result of efforts during the strengthening repulsion, is a promising methodological technique in terms of speed and increase the level of strength training. Inclusion in the special preparatory stage of the training process, the plyometric exercise complexes that we offer and the tactics of using them in a separate lesson that provides different exercise sequences with mandatory control of the rest interval between the orientation and strict dosing rows in each approach, contributing to improve results in a "smooth" run.

Conclusion. So, an experience-based study we found a significant increase in performance in speed-strength training among track and field athletes experimental group. The study and analysis of the results can be concluded that the use of plyometric exercises leads to an increase in the level of speed-strength readiness of 12-13-year-old track and field athletes.

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Rezyume: Trening samaradorligini belgilovchi asosiy omil yengil atletikadagi jarayon - bu musobaqani bajarish tezligi kabi jismoniy sifatlarning rivojlanishini uzviy aks ettiruvchi mashqlar tezlik, kuch va uning tezligining namoyon bo'lishi, ya'ni tezlik-kuch sportchining tayyorgarligi. Maqolada foydalanish haqida gap boradi tezlik-kuch darajasini oshirish uchun maxsus mashqlar 12-13 yoshli sportchilarning tayyorgarligi.

Резюме: Основным фактором, определяющим эффективность тренировочного процесса в легкой атлетике, является скорость в выполнении соревновательного упражнения, которая интегрально отражает развитие таких физических качеств, как быстрота, сила и ее скоростное проявление, т. е. скоростно-силовая подготовленность спортсмена. В статье рассматривается использование специальных упражнений для повышения уровня скоростно-силовой подготовленности легкоатлетов 12–13 лет.

Kalit so'zlar: Yosh sportchilar, tezlik-kuch mashqlari, komplekslar mashqlar.

Ключевые слова: Юные легкоатлеты, скоростно-силовая подготовка, комплексы упражнений.

THEORETICAL ASPECT OF EFFICIENT UTILIZATION OF CURRENT ASSETS IN AGRICULTURE

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Summary: *The article is devoted to the study of the peculiarities of working capital utilization at agricultural enterprises. The paper presents the classical indicators of working capital utilization efficiency, which in agriculture are subject to certain modifications due to specific features of this industry. According to the results of the study, it was determined which specific features of the agricultural industry have the greatest impact on the peculiarities of the use of current assets in agriculture. In general, the study reflects the need to take into account the distinctive features of the industry in accounting, planning and assessment of financial and economic activities of the enterprise.*

Key words: *agriculture, current assets, specific features of the agricultural industry, rationing of current assets in agriculture, efficiency of the use of current assets in agriculture, composition and structure of current assets in agriculture.*

INTRODUCTION.

A significant component of the production capability within agricultural establishments lies in their current assets. These assets' framework must be geared towards sustaining operations, holding adequate work-in-progress resources, materials, cash reserves, and ensuring timely completion of finished goods. The effective utilization of these assets plays a pivotal role in driving agricultural production expansion. The financial health of enterprises, along with their operational effectiveness, hinges on the status of current assets. The efficiency of their management directly influences expenditure, production costs, and consequently, the financial outcomes of these enterprises. Thus, the prudent management of current assets stands as a paramount aspect within the realm of strategies aimed at enhancing operational performance and fortifying the financial foundation of agricultural enterprises.

The efficiency of current asset utilization in agriculture is contingent upon a spectrum of internal and external factors. Internally, factors like organizational strategy, economic and pricing policies, asset composition, and inventory valuation methods play pivotal roles. Externally, elements such as government support for agriculture, inflation rates, banking sector policies concerning credit provision for the real economy sector, the status and growth trajectory of the regional financial system, geographic positioning, production magnitude, organizational breadth, and industry ties emerge as influential determinants.

METHODOLOGY.

In agriculture, as in other industries, assessing the efficiency of current asset utilization is crucial for determining the financial health and performance of a business. The 'current assets turnover coefficient' is an important indicator used to evaluate how well a company is utilizing its current assets to generate revenue.

The traditional formula for the current asset turnover ratio is:

Current Assets Turnover Ratio = Revenue / Average Annual Value of Current Assets

However, in livestock enterprises, especially in agriculture, the formula is modified to account for specific factors such as the cost of young stock transferred to the main herd and the cost of sold livestock of the main herd.

The modified formula for the turnover ratio in agriculture may look something like this:

Current Assets Turnover Ratio (Modified) = (Revenue - Cost of sold livestock of the main herd) / (Average Annual Value of Current Assets + Cost of young stock transferred to the main herd)

The Attachment Ratio, as you've described, is a financial metric that indicates the amount of current assets required for each unit of revenue generated. In this case, you've specified that it is measured per 1 sum of revenue. The term "attachment" here refers to the attachment of current assets to revenue.

The formula for the Attachment Ratio can be expressed as follows:

$$\text{Attachment Ratio} = (\text{Current assets} / \text{Revenue})$$

Current assets is the difference between a company's current assets (such as cash, accounts receivable, and inventory) and its current liabilities (such as accounts payable and short-term debt). It represents the liquidity available to a business to fund its day-to-day operations.

The turnover ratio, which is the inverse of the Attachment Ratio, measures how efficiently a company uses its assets to generate sales. It is calculated by dividing the revenue by the *current assets*.

$$\text{Turnover Ratio} = (\text{Revenue} / \text{Current assets})$$

In agriculture, as with any other industry, the Attachment Ratio can be used to assess the efficiency of working capital utilization. However, it's important to note that the specifics of agriculture, such as the seasonality of production, the impact of weather on operations, and the long production cycles, can influence the working capital requirements and, consequently, the Attachment Ratio.

«Duration of one turnover». The time interval that starts from the moment of investment in current assets and ends at the moment of receipt of proceeds from the sale of products manufactured at the expense of these assets. The «Duration of one turnover» in the context of current assets can be determined by the formula:

$$\text{Duration of one turnover} = \text{Average current assets} / \text{Cost of goods sold} \times 365$$

Here's a step-by-step explanation:

1. Average Current Assets: This is the average value of current assets over a specific period (e.g., a year). It can be calculated as:

$$\text{Average current assets} = (\text{Current assets at the beginning of the period} + \text{Current assets at the end of the period}) / 2$$

2. Cost of Goods Sold (COGS): This is the total cost incurred to produce the goods that were sold during the period.

3. Multiply by 365: This converts the ratio into days, providing the duration of one turnover in terms of days.

Thus, the formula helps determine the average number of days it takes for an investment in current assets to be converted into cash receipts from sales.

Material yield is an indicator that measures the efficiency of converting material costs into revenue. It is determined by the following formula:

$$\text{Material Yield} = \text{Revenue from Sold Products} / \text{Material Costs}$$

Where:

- Revenue from Sold Products: The total income generated from selling the products.
- Material Costs: The total expenditure on materials used in the production of those sold products.

This ratio indicates how much revenue is generated for every unit of currency spent on material costs. A higher material yield implies greater efficiency in utilizing materials to produce revenue.

Material intensity is indeed the inverse of material yield. It indicates the amount of material costs incurred for each unit of revenue generated from sold products. The formula to determine material intensity is:

$$\text{Material Intensity} = \text{Material Costs} / \text{Revenue from Sold Products}$$

This ratio shows the material cost required to generate one unit of revenue. A lower material intensity indicates more efficient use of materials in generating revenue.

The profitability of stocks (or inventories) indicates how many units of profit are generated per unit of inventory in an agricultural enterprise. The formula to determine the profitability of inventories is:

$$\text{Profitability of Stocks} = \text{Profit} / \text{Average Inventory}$$

Where:

Profit: The net profit earned by the agricultural enterprise over a specific period.

Average Inventory: The average value of the inventory over the same period. It can be calculated as:

$$\text{Average Inventory} = (\text{Inventory at the beginning of the period} + \text{Inventory at the end of the period}) / 2$$

This ratio measures the efficiency with which an agricultural enterprise uses its inventory to generate profit. A higher ratio indicates better utilization of inventory in generating profits.

Also, if we consider working capital in dynamics, absolute and relative release is also possible in agriculture, their occurrence indicates a more efficient use of working capital. In addition to the generally accepted indicators of efficiency of working capital utilisation, various private indicators can be used. Agricultural enterprises may use the following indicators of efficiency of working capital utilization:

- in crop production - seed consumption per 1 hectare of sown area or per 1 centner of harvested crop;

- in animal husbandry - feed consumption per unit of production (meat, milk) [1, p. 108].

The formula for determining seed consumption per 1 hectare of cultivated area is as follows:

$$\text{Seed Consumption per 1 Hectare} = \text{Total Seed Used} / \text{Total Cultivated Area (in hectares)}$$

Where:

- Total Seed Used: The total amount of seed used for planting.

- Total Cultivated Area (in hectares): The total area of land cultivated for the crop.

This indicator helps measure the efficiency of seed usage in crop production, allowing agricultural enterprises to assess and optimize their seeding practices.

To determine the efficiency of seed usage by calculating the amount of seed per 1 quintal of harvested yield, you can use the following formula:

$$\text{Seed Consumption per 1 Quintal of Harvested Yield} = \text{Total Seed Used} / \text{Total Harvested Yield (in quintals)}$$

Where:

- Total Seed Used: The total amount of seed used for planting.

- Total Harvested Yield (in quintals): The total crop yield harvested, measured in quintals.

This indicator helps in evaluating how effectively seeds are converted into harvested crop yield, providing insight into the efficiency of seed usage in agricultural production.

In livestock breeding, the efficiency of working capital utilization can be assessed by calculating fodder consumption per unit of production. The formula for determining fodder consumption per unit of production (such as meat or milk) is as follows:

$$\text{Fodder Consumption per Unit of Production} = \text{Total Fodder Consumed} / \text{Total Production (units)}$$

Where:

- Total Fodder Consumed: The total amount of fodder used during the production period.

- Total Production (units): The total amount of livestock product produced, measured in appropriate units (e.g., kilograms of meat or liters of milk).

This indicator helps measure the efficiency of fodder usage in livestock breeding, providing insight into how effectively the feed is being converted into livestock products.

CONCLUSION.

The composition and structure of current assets in agriculture are heavily influenced by the unique characteristics of the industry. One of the most important features of the agricultural sector is the presence of biological assets, which include animals, plants, and fungi. Managing these assets

is challenging due to the complexity of their reproduction and subsequent accounting. Various factors impact the operation of biological assets, many of which are difficult to control. However, technological advancements are gradually increasing the number of manageable parameters.

This presents a significant potential for enhancing the efficiency of working capital utilization in agriculture through scientific and technological progress. The peculiarities of current asset rationing in agricultural enterprises also stem from the nature of biological assets. For instance, "Animals for growing and fattening" are included in production stocks but are not subject to rationing because they are not consumed in a manner that allows for a consumption or stock rate.

In crop production, rationing is based on sown areas, considering variety and quality requirements. In livestock enterprises, rationing is based on the caloric intake of animals. Specific items rationed in agricultural enterprises include fodder, seeds, fertilizers, pesticides, and other non-specific stocks. By understanding and leveraging these unique aspects of current asset management, agricultural enterprises can improve their operational efficiency and capitalize on advancements in technology

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Rezyume: Maqola qishloq xo'jaligi korxonalarida aylanma mablag'lardan foydalanish xususiyatlarini o'rganishga bag'ishlangan. Asarda ushbu sohaning o'ziga xos xususiyatlari tufayli qishloq xo'jaligida ma'lum modifikatsiyalarga duchor bo'lgan aylanma mablag'lardan foydalanish samaradorligining klassik ko'rsatkichlari keltirilgan. Tadqiqot natijalariga ko'ra qishloq xo'jaligi sanoatining qaysi o'ziga xos xususiyatlari qishloq xo'jaligida aylanma mablag'lardan foydalanish xususiyatlariga eng katta ta'sir ko'rsatishi aniqlandi. Umuman olganda, tadqiqot korxonaning moliyaviy-iqtisodiy faoliyatini hisobga olish, rejalashtirish va baholashda sohaning o'ziga xos xususiyatlarini hisobga olish zarurligini aks ettiradi.

Резюме: Статья посвящена исследованию особенностей использования оборотных средств на сельскохозяйственных предприятиях. В работе представлены классические показатели эффективности использования оборотных средств, которые в сельском хозяйстве подвергаются определённым модификациям вследствие специфических особенностей данной отрасли. По результатам исследования было определено, какие именно специфические особенности сельскохозяйственной отрасли оказывают наибольшее влияние на особенности использования оборотных средств в сельском хозяйстве. В целом, исследование отражает необходимость учета отличительных черт отрасли при учете, планировании и оценке финансово-хозяйственной деятельности предприятия.

Kalit so'zlar: qishloq xo'jaligi, aylanma mablag'lar, qishloq xo'jaligi sanoatining o'ziga xos xususiyatlari, qishloq xo'jaligida aylanma mablag'larni normalizatsiya qilish, qishloq xo'jaligida aylanma mablag'lardan foydalanish samaradorligi, qishloq xo'jaligida aylanma mablag'larning tarkibi va tuzilishi.

Ключевые слова: сельское хозяйство, оборотные средства, специфические особенности сельскохозяйственной отрасли, нормирование оборотных средств в сельском хозяйстве, эффективность использования оборотных средств в сельском хозяйстве, состав и структура оборотных средств в сельском хозяйстве.

**PHILOSOPHICAL ANALYSIS OF PROBLEMS IN THE ACTIVITY OF DEVIANT
BEHAVIOR OWNERS**

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*Samarkand state named after Sharof Rashidov University of Sociology and Social teacher of the
work department*

Summary: *In this article, the author writes about addictive morality, which is considered one of the forms of immorality in society, that is, addiction, mental dependence, a person's dependence on an object and the domination of this object over a person. This article covers more about the types, causes and consequences of addiction. Such vices, which have a negative impact on personal morals, are considered one of the most urgent issues of today.*

Key words: *Ethics, personality, addiction, moral culture, pharmacological-substance dependence.*

You have heard a lot about morality, manners, manners in kindergarten, at school, in the family, at rallies, radio, television, and the press always talk about morality. Hadiths and narrations, sermons of famous imams, poems, novels, and proverbs all point to one thing: a human child should have high morals.

In today's society, striving for good, refraining from evil, taking a critical approach to one's activities, renouncing violence and respecting life, establishing an order based on solidarity and social justice, patience and tolerance, duty and responsibility the full realization of the human factor has risen to the level of value, and the importance of creating such a spiritual environment is growing day by day. Because the need for moral consciousness and attitude, social activity, social political dialogue and self-awareness, self-evaluation and self-improvement through self-criticism is the moral- determines the moral environment, its image and directions of social development.[1]

Morality is a set of principles or values that guide people and societies in distinguishing between right and wrong behavior. It can encompass various aspects of human behavior, including actions, intentions, thoughts, and emotions. But there is another form of morality, which is addictive morality, which leads a person down a path of destruction and destroys his own future.

Addictive morality (English addiction) means addiction, dependence, mental dependence. Addictive behavior is the tendency of deviant behavior to escape from reality by altering their state of mind by taking certain substances or focusing their attention on a certain type of activity aimed at developing and maintaining their intense emotions. is one of the forms of formation.[2] This process covers a person so much that it even starts to control his life. A person becomes helpless in front of his passion. Willpower weakens and makes it impossible to resist addiction.

According to the given information, there are the following forms of addictive behavior:

Chemical dependence (smoking, drug addiction, drug addiction, alcohol addiction);

Violation of eating habits (overeating, hunger. Avoiding food);

Gambling - addiction to sports and various games (computer addiction, gambling);

Sexual addiction (zoophilia, fetishism, voyeurism, necrophilia, sadomasochism);

Work or work addiction, etc.

Attached (addictive) morality as a type of deviant morality of a person, in turn, has many types that are especially differentiated according to the object of addiction. Theoretically (under certain conditions), what objects or forms of activity could these be? - chemicals, money, work, games, exercise or sex.

It is known that universal human experience, social norms, values, knowledge and methods of activity are acquired by a person in the process of communication with other people, and the addict stops himself from these processes. He stops enriching his life experience, thereby disrupting the most important tasks of communication. In the course of the addict's joint activities with other people, mutual difficulties arise. Along with dysfunctional processes of communication, important

mechanisms of interpersonal perception, such as identification, empathy, reflection, are broken, changed and lose their value. Therefore, the ability to put oneself in the place of a partner, share grief, and imagine how others perceive oneself is lost.[3]

The development of addictive behavior goes unnoticed. In the beginning, addictive behavior is seen in satisfying the needs of the individual. Then, gradually, a person begins to develop a behavior that he cannot control. The duration of addictive behavior is determined depending on the substance a person is taking, his age, gender, and individual characteristics.

An addicted person tries to escape from a difficult life situation rather than finding a solution to it. Adaptive capabilities also begin to break down at the psychophysical level.

At the first stage, a person experiences psychological discomfort. Each person reacts to a sudden drop in mood differently. In some people, there is a natural resistance to a difficult life situation, that is, a failure to take responsibility for what is happening, for the decision made. Some people try their best to get out of a difficult life situation because they realize that in the end it will be impossible to solve the problem.

Addicts do not feel the difficulties of experiencing a difficult life situation. Such people try to artificially change their mind and get positive emotions in order to avoid the problem. After that, the person will have a fantastic illusory solution to the problem. This method is able to outperform other methods of solving problems. This is easily fixed in a person's behavior and interferes with solving the problem in a natural way. Also, this method attracts the addict because of its ease of solving the problem. As a result, a person becomes isolated from his problems, simply forgets about problems and things that bother him.

The owner of addictive behavior also has problems in communication with close people, a light attitude towards close people is felt. An addict wants solitude and withdrawal (by himself).

Addictive morality means that a person escapes from the real life he lives by changing his state of consciousness.

The following psychological characteristics of persons with an addictive form of morality are distinguished:

1. Low resistance to adversity, along with good resilience to crisis situations. This is caused by the presence of hedonistic directions in a person - to have immediate satisfaction, to seek to satisfy one's desires. If the urges are not satisfied, then addicts react by either exploding negative emotions or avoiding the problems that arise.

2. A hidden complex of imperfection combined with outward superiority. Frequent mood swings, insecurity, and avoidance of situations where their abilities can be objectively tested are reflected in.

3. Trying to lie. Addicts often do not keep their promises, are distinguished by their lack of evidence and non-observance of rules.

4. External social relations combined with fear of intense emotional interactions.

5. They seek to accuse others, even though they know they are innocent.

6. Seeking to avoid responsibility when making decisions. Shifting responsibility to others, looking for exculpatory evidence when necessary.

7. Stereotyping and repetition of morality. The resulting stereotype of morality is predictable, but it is difficult to change it.

8. Dependency. Addictive orientation manifests itself in the form of submission to the influence of other people. Sometimes there is passivity, lack of independence, seeking help.

9. Anxiety. Imperfection is closely related to the dependency complex. The peculiarity of this is that in crisis situations, anxiety can fall into the background, at this time it occurs without obvious reasons in ordinary life or in events that do not give a real reason for anxiety.[4]

The most acute form of self-destructive morality is manifested in the violation of the instinct of self-preservation or preservation of life. This instinct plays an important role in the life of the animal world and humanity, because its effect is based on the main stimuli of the activity of a living

organism - "punishment, pleasure" stimuli. Therefore, its violation is related to the violation of homeostasis - the complex of maintaining and balancing vital functions.

Homeostasis is a balanced state of any system that is maintained by acting against internal and external factors that disrupt this balance.

In fact, although they are less common in the animal world than in humans, suicides can also be observed in animals, such as whales. Animals often try to kill themselves in difficult emotional situations caused by the loss of a partner, loss of freedom, and even the loss of an owner. Sometimes in such a situation, they refuse to eat, try to injure themselves. Man is the only creature on earth who clearly imagines the limits of his life path. His attitude towards death is very complex and ambiguous: He seems to be always prepared for it and at the same time he is never fully prepared. This ambivalent relationship is reflected in a number of artistic works. Therefore, the problem of suicide also depends on the ratio of rational - conscious and irrational - intuition knowledge. In this respect, suicide is not a temporary measure for a person. After all, nothing can be exchanged for anything.

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Rezyume: Muallif ushbu maqolasida jamiyatdagi axloqsizlik shakllaridan biri hisoblangan qaramlik, ruhiy qaramlik, shaxsning biror narsaga qaramligi va bu obyektning shaxs ustidan hukmronligi haqida yozadi. Ushbu maqolada giyohvandlikning turlari, sabablari va oqibatlari haqida ko'proq ma'lumot berilgan. Shaxsiy ma'naviyatga salbiy ta'sir ko'rsatuvchi bunday illatlar bugungi kunning eng dolzarb masalalaridan biri sanaladi.

Резюме: В данной статье автор пишет о аддиктивной морали, которая считается одной из форм безнравственности в обществе, то есть аддикции, психической зависимости, зависимости человека от объекта и доминирования этого объекта над человеком. В этой статье рассказывается больше о типах, причинах и последствиях зависимости. Подобные пороки, оказывающие негативное влияние на нравственность личности, считаются одной из самых актуальных проблем современности.

Kalit so'zlar: Etika, shaxsiyat, giyohvandlik, axloqiy madaniyat, farmakologik-moddaga qaramlik.

Ключевые слова: Этика, личность, зависимость, моральная культура, фармакологическая зависимость.

COTTON CLUSTERS: FEATURES AND CHARACTERISTICS

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Summary: *The article studies the main aspects of the formation and functioning of cotton clusters. Cotton clusters are associations of agricultural enterprises, processing plants, logistics companies, research institutes, and other organizations interacting to improve the efficiency and competitiveness of cotton production. The article discusses the economic and social benefits of clusters, such as increased productivity, improved product quality, job creation, and access to innovative technologies. The main problems and challenges facing clusters are analyzed, including lack of funding, infrastructural constraints, and lack of qualified personnel. Special attention is paid to the role of state support and regulation in the development of cotton clusters. The conclusions of the article emphasize the importance of coordinating the efforts of various actors for the successful functioning of clusters and the sustainable development of the industry.*

Key words: *cotton clusters, agro-industrial production, efficiency, innovations, state support, agriculture, competitiveness, sustainable development, agro-technologies, economic advantages, social advantages.*

In modern economics, the cluster approach to the development of industries and regions is becoming increasingly important. Of particular interest are cotton clusters, which unite cotton producers, processing enterprises, equipment suppliers, and other participants in the value chain. In this context, there is a need for a deeper study of the features and characteristics of cotton clusters to identify the factors and conditions that contribute to their effective functioning and development.

The purpose of this article is to analyze the main features and characteristics of cotton clusters, identify the key factors and mechanisms that determine their successful functioning, and develop recommendations for optimizing their activities. To achieve this goal, the study aims to examine the organizational, economic, and social aspects of the formation and functioning of cotton clusters based on an analysis of current theoretical approaches and practical experience.

The study of cotton clusters holds significant scientific and practical relevance in the context of the development of the agricultural sector and regional economy as a whole. The results of this work can serve as a basis for developing strategies for the development of such clusters and for making management decisions in the agro-industrial complex.

Clusters have a long history of development. In the 19th century, English economist Alfred Marshall was one of the first to develop the theory of local production, according to which enterprises located close to each other, by combining production efforts, can achieve a synergistic effect based on the possibility of significant collaboration. The term "cluster" became widely used by economists in the 1980s. The definition of a cluster was first introduced by American economist Michael Porter, according to whom a cluster is a group of neighboring interconnected companies and associated organizations operating in a specific field and characterized by common activities and mutual complementarity.

The literature on this topic contains many articles that explore the development experience of cotton clusters in various countries. For example, in the work of researcher S.P. Ivanov, "Cotton Processing Cluster: The Role of Innovation in Enhancing Competitiveness," the experience of creating successful clusters in Russia and other countries is examined.

Another important aspect of studying cotton clusters is analyzing the impact of globalization on their development. In the article by K. Singh, «Globalisation and Indian Cotton Textiles Industry» the impact of globalization processes on the production and export of cotton products in India is discussed

It is also important to study modern trends in the development of cotton clusters, such as the implementation of innovative technologies, the sustainable use of natural resources, and corporate social responsibility.

In Uzbekistan, cotton-textile industry clusters play a key role in the process of structural transformations and diversification of the national economy. To study the economic potential of enterprises and ensure employment, increase incomes, and improve the quality of life of the population, special attention is paid to forming a value chain in the industry. This will enhance production efficiency and the adoption of innovations. The Strategy for the Development of New Uzbekistan for 2022-2026 identifies "deepening structural changes and increasing competitiveness through modernization and diversification of the leading sectors of the national economy" as crucial tasks. Ensuring the effective implementation of these tasks entails organizing and improving the cluster management system, which is formed based on the horizontal and vertical integration of textile enterprises' activities. The successful realization of these goals necessitates increasing the volume and quality of products, the competitiveness of enterprises, and export potential through the modernization of management processes in textile industry enterprises. This requires developing measures aimed at improving the mechanisms and models of managing textile industry enterprises. Practice has shown that the production and sale of finished products, as opposed to raw materials and supplies, significantly enhance the competitiveness of the national economy. This is primarily due to the growth in added value, the increase in the number of employed people, and the number of active economic entities. In this regard, the economy should be viewed through the lens of clusters, as they strengthen the competitive advantages of industries, regions, and the economy as a whole.

In this context, the implementation of the cluster system in the republic, especially in cotton growing, grain production, horticulture, and other areas of agriculture, is of great importance. A significant part of this system consists of cotton-growing clusters. Currently, the number of clusters in the cotton-textile sector of our country has reached 75 units (Table 1). [3]

Table 1

Cotton and textile clusters in the Republic of Uzbekistan

Territory	Number of clusters	Cotton field, ha	
		whole	on average one cluster
All over the Republic	75	701 426,6	9352,4
Republic of Karakalpakstan	3	28 161	9 387,0
Andijan province	9	60 126	6 680,7
Bukhara province	8	112 329	14 041,1
Jizzak province	4	28 068	7 017,0
Kashkadarya province	6	70 200	11 700,0
Navoi province	2	32 600	16 300,0
Namangan province	6	55 182	9 197,0
Samarkand province	8	75 580	9 447,5
Surkhandarya province	5	49 846	9 969,2
Syrdarya province	4	42 606,6	10 651,7
Tashkent province	6	54 600	9 100,0
Fergana province	8	50 330	6 291,3
Khorezm province	6	41 798	6 966,3

The cluster, as a new mechanism of economic relationships and organization of production, has recently become a frequently discussed topic among scientists, specialists, agricultural workers, and the general public. This issue is widely covered in the press and mass media.

In short, a cluster is a mechanism that encompasses the entire process, from growing agricultural products to their deep processing into finished products with high added value.

The cluster system has several advantages:

- it brings industry, specifically processing, closer to agriculture.
- it increases the possibility of using new innovative technologies, advanced scientific and technical achievements, and products at the industrial level.
- it creates conditions for attracting direct investments and the widespread adoption of modern foreign technologies in production.
- it enhances the ability to export finished products with high added value through market research and market analysis.
- it improves the level of economic support and services from organizations such as finance, banking, and insurance, among other positive aspects.

Of course, considering the extensive development of this system in the country in the future, it is necessary to address the problems currently discussed by some experts. First, the status of clusters needs to be defined at the legislative level, and a balance must be found between clusters and farming enterprises in their economic and other relationships. Both agricultural producers in the form of farming enterprises and processing enterprises within the cluster are, from a legal standpoint, separate economic entities. Therefore, each of them operates independently in the free market according to their economic and other interests.

When defining strategic prospects for export-oriented cotton-textile products, positive aspects can be identified for addressing issues that may be adapted to the conditions of the Republic of Uzbekistan:

- the state applies certain support measures: direct financial assistance, including the provision of preferential loans;
- state encouragement of innovation (introduction of new technologies, pilot, and mass production of new products), including by granting enterprises the right to additional tax exemptions;
- export orientation and promotion of foreign economic activity, which includes insurance, organization and participation in international exhibitions, providing market information, and finding foreign partners.

The conducted research focuses primarily on trade competitiveness, which is defined as the ability of a country to increase its market share in global trade. Strengthening vertical and horizontal linkages among participants in the cotton-textile cluster will allow for more effective resolution of regional issues and general tasks related to personnel training, acquisition of machinery and equipment, improvement of seed production, and the formation of fairer pricing within the chain: production of raw cotton – cotton fiber – cotton yarn – fabrics – garments – sales. All of this should work towards solving tasks related to the production of competitive garment products and the Republic's entry into international markets (figure-1).

As a method for testing the hypothesis of the clustering effect and the possibility of its quantitative assessment, we have calculated the contribution of each participant to the increase in the total profit of the cotton cluster based on the following actions

At the level of cotton farms engaged in cotton cultivation:

- synchronized cultivation of land based on the application of a technological map for given natural conditions and with a given raw cotton yield;
- joint use of agricultural machinery during the periods of sowing, growing and harvesting of raw cotton;
- centralized supply of seed, mineral fertilizers and chemical plant protection products;
- organization of the raw cotton marketing system.

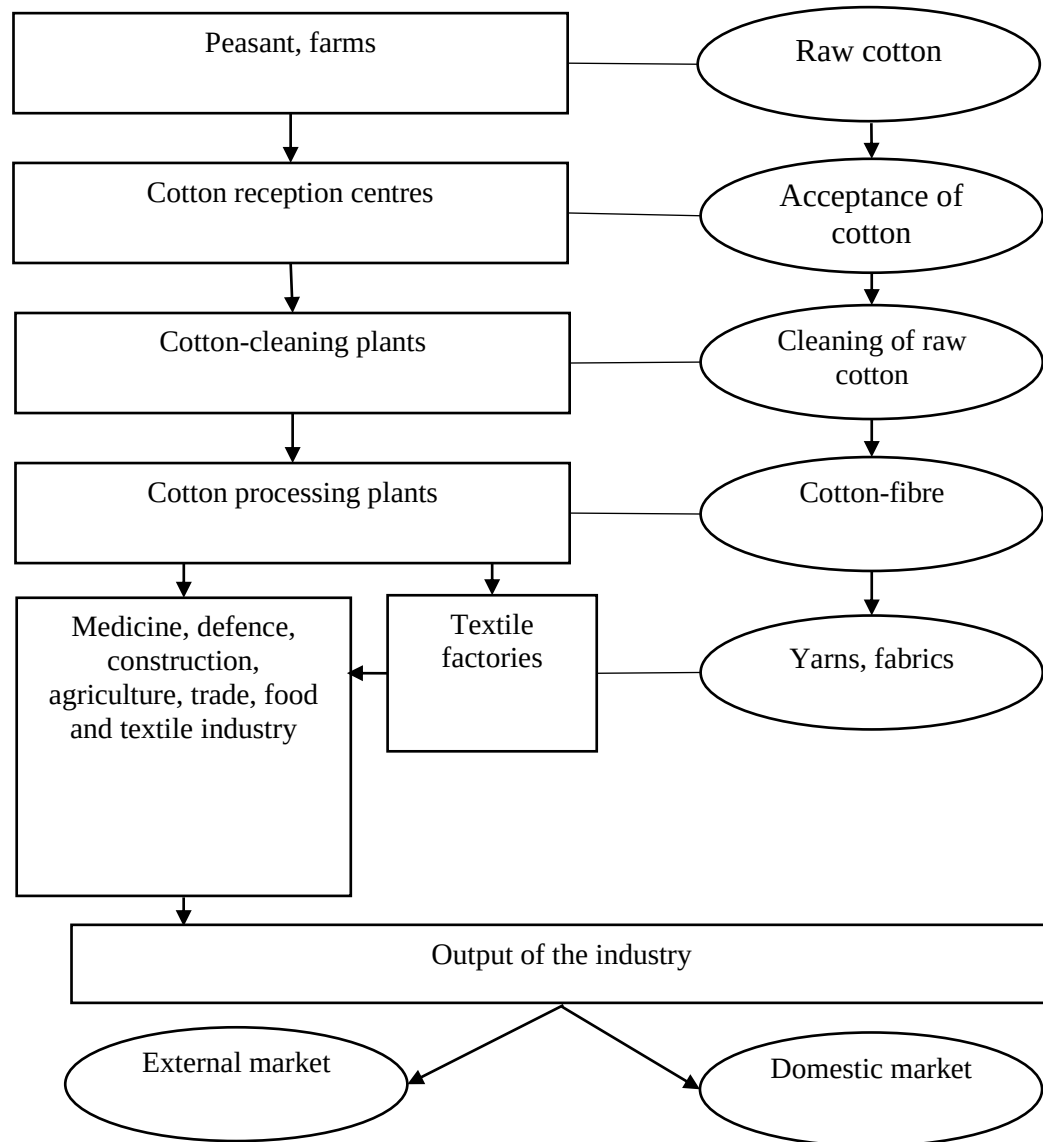


Fig-1. Cluster model for cotton processing

At the level of cotton processing enterprises engaged in the production of cotton fiber, seeds, and by-products of raw cotton: reducing the cost of producing cotton fiber by lowering the cost of supplied raw materials.

At the level of enterprises engaged in the production of cotton yarn:

- reducing the cost of producing cotton yarn;
- increasing the yield of cotton yarn by improving the quality of the fiber.

At the level of enterprises engaged in the production of fabric:

- reducing the cost of producing cotton fabric;
- improving the quality of produced cotton fabric.

At the level of factories engaged in the production of ready-made garments:

- reducing the cost of producing garments by lowering the price of supplied fabric;
- increasing the yield of garments by improving the quality of fabric and yarn.

An important feature of the cluster model is the formation of technological links between production participants, creating a full production cycle within the cluster. This, in turn, provides a number of economic advantages. In particular, supporting domestic raw material producers will increase production, boost the processing of a larger portion of previously exported cotton fiber within the country, and result in exporting finished textile products with high added value

The main features and characteristics of cotton clusters include:

1. **Geographical concentration:** Clusters are most often formed in specific regions where the climate and soil conditions are most suitable for growing cotton.
2. **Interaction of chain participants:** In clusters, farmers, processors, equipment and technology suppliers collaborate to enhance production efficiency and market competitiveness.
3. **Exchange of experience and knowledge:** Cluster participants actively share information and advanced production methods, which contributes to the improvement of the quality and quantity of cotton produced.
4. **Increasing economic efficiency:** Through cooperation and large-scale production, cotton clusters can reduce costs and increase output, positively affecting the incomes of all participants.
5. **Social responsibility:** An important aspect of cotton clusters is the adherence to ecological, labor, and social responsibility standards, which promotes the sustainable development of the region and improves the living conditions of the local population.

In conclusion, cotton clusters represent an effective form of organizing agro-industrial production, contributing to the sustainable development of the industry. They provide economic and social benefits, foster the implementation of innovations, and enhance the competitiveness of products in the global market. However, to fully realize the potential of clusters, coordination of efforts among the government, business, and scientific community is necessary to overcome existing problems and challenges.

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Rezyume: Maqolada paxtachilik klasterlarining shakllanishi va faoliyatining asosiy jihatlarini o'rganiladi. Paxtachilik klasterlari qishloq xo'jaligi korxonalari, qayta ishlash zavodlari, logistika kompaniyalari, ilmiy-tadqiqot institutlari va paxtachilikning samaradorligi va raqobatbardoshligini oshirish uchun o'zaro hamkorlik qiluvchi boshqa tashkilotlarning birlashmalaridir. Maqolada hosildorlikni oshirish, mahsulot sifatini yaxshilash, yangi ish o'rinalari yaratish va innovatsion texnologiyalardan foydalanish kabi klasterlarning iqtisodiy va ijtimoiy afzalliklari ko'rib chiqiladi. Klasterlar oldida turgan asosiy muammolar va muammolar, jumladan, moliyalashtirishning etishmasligi, infratuzilma cheklovlari va malakali kadrlar etishmasligi tahlil qilinadi. Paxtachilik klasterlarini rivojlantirishda davlat tomonidan qo'llab-quvvatlash va tartibga solishning roliga alohida e'tibor qaratilmoqda. Maqolaning xulosalari klasterlarning muvaffaqiyatli ishlashi va sanoatning barqaror rivojlanishi uchun turli ishtirokchilarning sa'y-harakatlarini muvofiqlashtirish muhimligini ta'kidlaydi.

Резюме: В статье исследуются основные аспекты формирования и функционирования хлопководческих кластеров. Хлопководческие кластеры представляют собой объединения сельскохозяйственных предприятий, перерабатывающих заводов, логистических компаний, научно-исследовательских институтов и других организаций, взаимодействующих для повышения эффективности и конкурентоспособности хлопководства. В статье рассматриваются экономические и социальные преимущества

кластеров, такие как увеличение производительности, улучшение качества продукции, создание новых рабочих мест и доступ к инновационным технологиям. Анализируются основные проблемы и вызовы, стоящие перед кластерами, включая недостаток финансирования, инфраструктурные ограничения и нехватку квалифицированных кадров. Особое внимание уделяется роли государственной поддержки и регулирования в развитии хлопководческих кластеров. Выводы статьи подчеркивают значимость координации усилий различных участников для успешного функционирования кластеров и устойчивого развития отрасли.

Kalit so‘zlar: paxtachilik klasterlari, agrosanoat ishlab chiqarish, samaradorlik, innovatsiya, davlat tomonidan qo‘llab-quvvatlash, qishloq xo‘jaligi, raqobatbardoshlik, barqaror rivojlanish, agrotehnologiya, iqtisodiy foyda, ijtimoiy foyda.

Ключевые слова: хлопководческие кластеры, агропромышленное производство, эффективность, инновации, государственная поддержка, сельское хозяйство, конкурентоспособность, устойчивое развитие, агротехнологии, экономические преимущества, социальные преимущества.

UDK: 316.77:004.55

INTERNET MEDIA PROCESSES: HYPERTEXT - HYPERMEDIA – MULTIMEDIA

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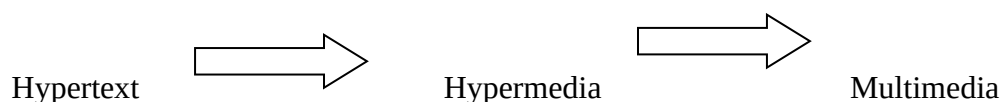
Karakalpak State University named after Berdakh

Summary: *The article describes the development processes of hypertext. It is known that the integration of the hypertext phenomenon is the basis of hypertext and multimedia. These processes develop in an integral relationship with each other. Studying it in the practice of Internet journalism will help to identify the problem.*

Keywords: *hypertext, hypermedia, multimedia, audio, video, graphics, text, hypertext material, formula.*

Today, the process of mutual integration of media and technology is getting stronger. As a result, new trends appear in the fields, and the dominance of modern problems, formatting, and visual materials will become more visible. In particular, video, photo, and graphic formats are often used along with artistic text. In such a situation, it is interesting to learn the phenomenal problems of Internet journalism from a practical and theoretical point of view. Among them, we believe that the mutual integration of hypertext, hypermedia, and multimedia requires theoretical research. Because in the process of researching the topic, we observed the interaction of hypertext, hypermedia, multimedia, and the effect of one on the other. In this paragraph, we will learn about the transition from hypertext to hypermedia, from hypermedia to multimedia, and the reasons that led to the emergence of one and the other in a special aspect.

Hypertext, hypermedia, multimedia complement each other due to internal and external possibilities, are mutually connected, and stimulate the creation of one another, that is, hypertext paves the way for hypermedia, hypermedia opens the way for multimedia.



Hypertext is a part of hypermedia that has a quality that does not exist. The concept of hypertext is a new, and at the same time, the most comprehensive concept, and it is considered one of the concepts of hypermedia and multimedia. One of the reasons for the emergence of hypermedia and multimedia in journalism is hypertext. That's right, we believe that it is necessary to consider the transition and integration of hypertext to hypermedia.

In science "from hypertext to hypermedia" we extend theoretical definitions of a similar orientation to each other. "Other possibilities are added to hypertext - video, audio, various graphics. As a result, hypertext becomes hypermedia" [1]. According to Ilimpaz, the expansion of hypertext will lead to hypermedia. This expansion is done by merging video, photos, graphics into the text. If hypertext connects texts in space and time, hypermedia connects multimedia elements (audio, photo, graphics, etc.) to hypertext. And in another document it is written that "hypermedia is the conversion of hypertext" [2]. According to the scientist, hypertext becomes a textual and visual informational form thanks to the expansion of hypermedia. This means to convey the information to the audience not only in the form of text, but also in the form of graphics, video information, and audio. The idea of inter-text expansion with the help of hyperlinks in the composition of hypertext has been enriched in a new way with the development of the Internet. We can see the convergence of hypertext to hypermedia due to the fact that the Internet media transmits information in a visual, multimedia format. As an example, we compare hypertext and hypermedia materials and analyze the convergence process:

Hypertext material: 02.04.2024 ж. www.daryo.uz: «Талимаржон» ИЕсте өрт болғаны хаққындағы хабар бийкар етилди». Three links to hypertext material are provided.

https://t.me/minenergy_uz/11016: «Социаллық тармақлардағы хабарларға мүнәсибет: «Талимаржон ИЕС пуў-газ қурылмалары реже тийкарында көриктен өткерилип, техникалық хызмет көрсетилмекте».

<https://daryo.uz/2021/01/20/yangi-angren-iesda-portlash-yuz-berdi-uch-kishi-halok-boldi/>: «Жаңа Ангрен» ИЕСде жарылыў жүз берди. Үш адам қайтыс болды».

<https://daryo.uz/2021/01/20/energetika-vazirligi-yangi-angren-iesda-yuz-bergan-portlash-yuzasidan-rasmiy-malumot-berdi/>: «Энергетика» министрлиги «Жаңа Ангрен» ИЕсте жүз берген жарылыў бойынша рәсмий мағлыўмат берди».

Formula: Text + text + text

In this hypertext material, three texts are interconnected, and almost all of the combined texts are written in informational genres.

Hypermedia material: 01.04.2024 ж. www.qalampir.uz: «Дағыстанда және 4 адам қамаққа алынды». Two types of linking methods are used in hypermedia material:

Текст: <https://qalampir.uz/uz/news/dogistonda-aksilterror-operatsiyasi-boshlandi-99469>: «Дағыстанда аксил террор операциясы басланды».

Видео: <https://t.me/qalampirlive/87793?single> «Дағыстанда дрон хұжими шөлкемлестирилди».

Formula: Text + text + video

As shown in the example, hypertext is the most common concept that led to the creation of hypermedia. More precisely, hypertext ensures the convergence of hypermedia, that is, it is considered as a necessary factor in the creation of hypermedia. Its ability to communicate with other texts and elements is related to hypermedia and multimedia. In this case, the hypertext containing hyperlinks combines long or close-range video and audio to itself, giving rise to the mergence of hypermedia.

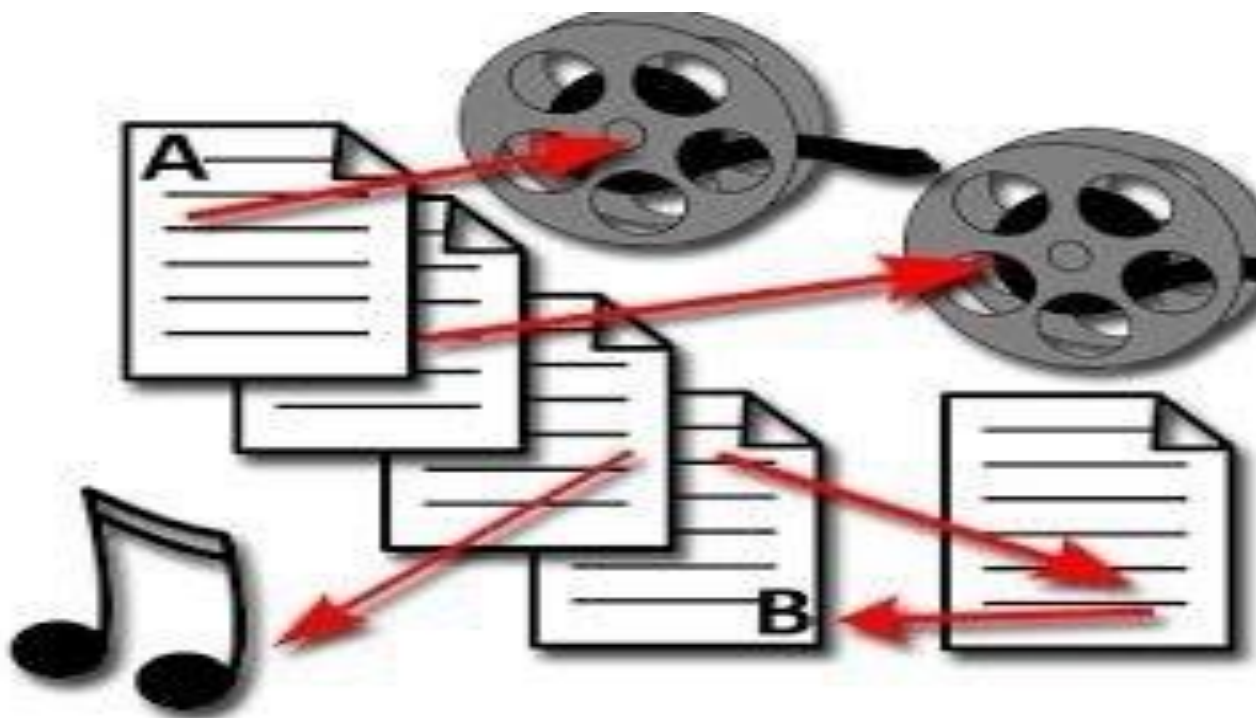


Figure 5.2.1. Hypermedia

"Hypermedia is a hypertext that uses graphics, audio, video, text and links to create a sense of a non-linear aura" [3]. The concept of hypermedia is defined as a logical and technical

development of the term hypertext. In this way, "hypertext has already appeared in journalism, but it has become the essence of hypermedia" [4]. Apart from the hypertext system, it can also be considered as a multi-channel database that provides fragments of animation, graphics, audio and music. "The story of the transformation of hypertext into hypermedia" [5]. Therefore, hypertext is a convergence to hypermedia due to its unique characteristics. It is also considered as "... hypermedia hypertext extension"[6]. This is because hypertext is based on texts, and hypermedia has the ability to expand with the help of text and multimedia elements. Based on the scientist's opinion, the possibility of hypertext branching and expanding across various multimedia forms hypermedia.

№	Hypertext	Hypermedia
1	Hypertext refers to the management of information related to plain text.	Hypermedia refers to linking hypertext with other tools such as graphics, audio, animations.
2	Hypertext only takes text into its work.	It includes graphics, photos, video, audio and others in its work.
3	There, only the text becomes part of the link.	There, together with the text, other multimedia will become a part of the link.
4	Hypertext is a part of hypermedia, which means that it is located under hypermedia.	Hypermedia is an object that combines hypertext and other phenomena.
5	Allows the user to move along the text in a non-linear way.	It uses multimedia elements to improve the multimedia experience.
6	It provides an opportunity to pass from one information to another.	It extends hypertext and offers the audience the ability to click to move text or other multimedia.

Nowadays, in modern journalism science, there are no lack of studies that describe approaches to hypermedia as a genre. The author of the theory "Hypermedia is a convergent genre" [7], in his composition, combined many formats at the same time and focused on the process of turning into a whole material. According to his idea, the idea of considering hypermedia as a convergent genre is not fully justified. This is because hypermedia is not more of a genre, but the format has its own meaning, that is, hypertext combines visual information from different locations and times. Groups of combined texts represent hypermedia. Hypermedia is considered a more convergent process than a genre. The trend of creating hypermedia material in Internet journalism is growing year by year.

We can appreciate the increasing demand of this audience to receive information in visual format and short texts. That's why the concept of hypertext and hypermedia materials is used in the article. For example, on Tuesday, March 28, 2024, the website www.gazeta.uz published the article "Ташкентте кўшли самал себепли тереклер қулап атыр". We analyze it according to special criteria of hypermedia:

Address of material on the site: <https://www.gazeta.uz/uz/2024/03/28/wind/>

Theme: «Ташкентте кўшли самал себепли тереклер қулап атыр».

Number of hyperlinks: 12 links

Multimedia elements: 8

Visual formats: Video, photos.

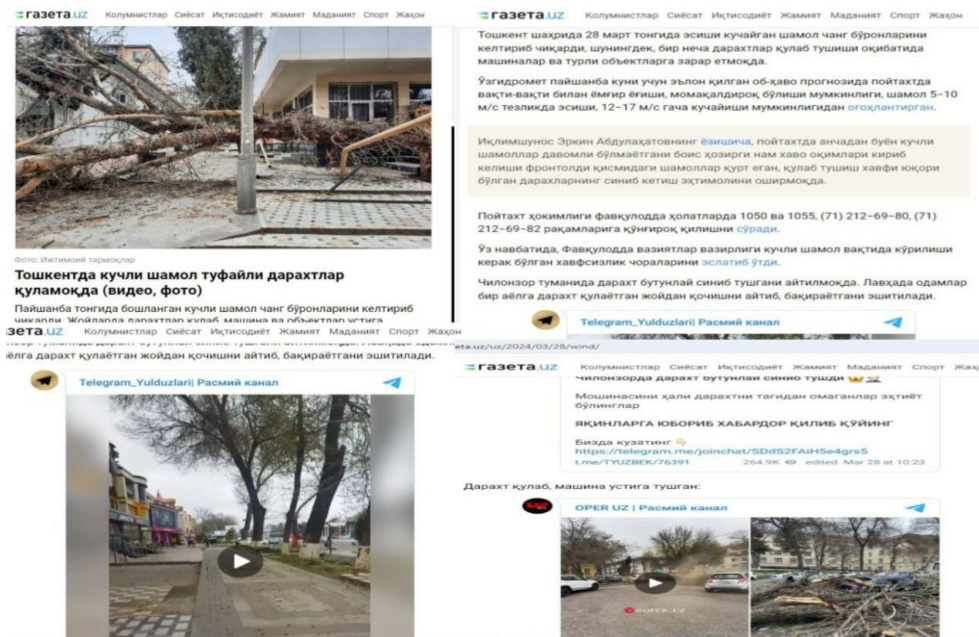


Figure 5.2.2. Hypermedia material

We found out that the content of leading sites in the Uzbek segment contains many hypertext materials, and very little hypermedia content. We can view hypermedia materials during the activity of www.gazeta.uz, www.daryo.uz, www.qalampir.uz sites. In the period from 2021 to 2024, there are very few hypermedia materials on www.kun.uz. The trend of writing hypermedia materials in online journalism from Karakalpakstan rarely worsens. It is possible to see more hypertext content on the sites selected as the research object. We consider this situation to be an exercise in adopting new trends in the region. This problem demands from the professional Internet journalists to adopt new views of hypertext, hypermedia and related materials.

In general, hypermedia is an extension of hypertext that includes text, graphics, audio, video, and other forms of media in its work.

Hypermedia, in turn, paves the way for multimedia. It combines visual multimedia elements from different locations, and multimedia converges in one location, without any links, from the format point of view. Formats combine with hypertext to create hypermedia. The two terms are similar, but multimedia collects information using one type of encoding, and hypermedia, in a similar way, connects multimedia elements using hyperlinks. More precisely, multimedia material shows various options, on the contrary, hypermedia connects all kinds of options.

Today, there are scientific opinions and theories about the interrelationship and peculiarities of hypermedia and multimedia. We will review their differences.

"Hypermedia is an interactive multimedia"[8], according to the basic sources. In this, the method of multimedia elements connecting with hypertext and expanding is taken into account. According to another scientist, "hypermedia synthesizes the concepts of hypertext and multimedia, that is, it originated from two terms: hypermedia = hypertext + multimedia." Multimedia is combined with hypertext to form hypermedia [9]. But we believe that this theory does not fully explain itself. Because in the course of research, hypermedia's unique characteristics, its feature of combining text with other formats, opens the way to more multimedia, that is, it turns formats that are not scattered from one text into a method of communication. This will build multimedia.

In the course of researching hypermedia and studying its unique features, its main differences with regard to multimedia, especially multimedia journalism, were identified:

changes categories	Hypermedia	Multimedia
Definition	It is an extension of hypertext and includes media types in its work.	It is a combination of several content formats, such as text, audio, image, graphics, animation and video.
Mains	A multimedia extension of	It describes several ways of

	hypertext.	presenting information.
Types	It isn't just linear.	It has two types: 1. Linear 2. not linear
Basics	It focuses on integration and interactivity.	It is connected to each other.
Connection	It communicates information that is a combination of hypertext and multimedia.	Hypertext and hypermedia together form multimedia.
Contents	We recommend clicking on the links to maximize your chances.	It is a multimedia delivery system.

Multimedia and hypermedia are similar terms. In most journalism, "... hypermedia is considered as a method of understanding multimedia"[10]. That is, the interaction of text, audio, and photo formats of hypermedia is related to the concept of multimedia material.

Today, it is difficult to imagine modern mass media without multimedia. According to the theory of O. V. Shlykova, "multimedia is a technology that uses traditional stylistic visual information and text: audio, video, graphics, animation" [11].

Now let's characterize the multimedia.

The word "multimedia" is derived from the English language and means "multi" - many, "media" - means of communication [12]. In order to present the information in the most suitable and interesting way, it is considered as the quality of materials management, when various elements such as video, photography, audio, graphics, animation and interactivity are used. It is a combination of content formats. In hypermedia, visual elements are located in a different place and time, not in the corresponding hypertext, but in a different space and time, with the help of links, in multimedia they find their presentation in one content. For example, "Дағ. Ҳақғөй миллетшиләр даўысы қалай өшириледи?" let's take longridin. Text, videos, photos, slide shows took place in multimedia longread. Unlike hypermedia, almost all of these multimedia elements are placed in one content space. Hypermedia-like communication links are not offered, there is no integration.

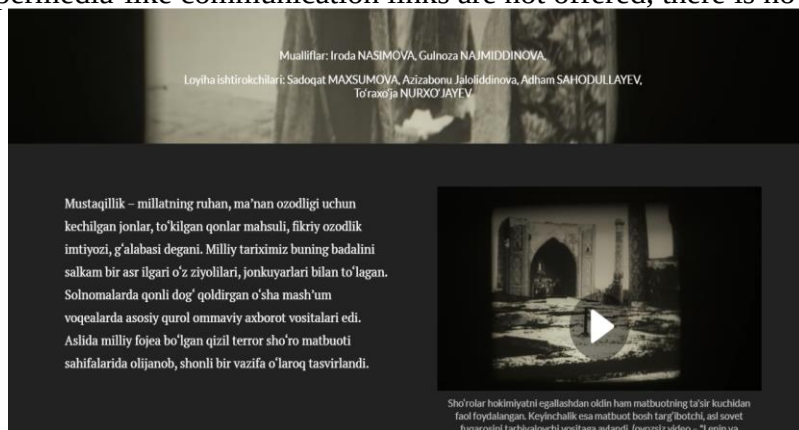


Figure 5.2.3. Documentary multimedia longread

In the above article, we can see that a set of visual formats combined into one content and material has been transformed into a multimedia material. Therefore, hypermedia helps the journalist to understand multimedia and its unique features. We believe that the technologies of recording multimedia materials appeared as a result of the properties and peculiarities of hypermedia. The reason is that the idea of expanding the relevant visual elements of information with the help of links is not directly from hypermedia. Hypermedia has matured and implemented multimedia. In addition, multimedia hypertext and extensions of various formats are calculated. In Internet journalism, hypertext, hypermedia, and multimedia serve as a factor in the realization of new trends.

In general, hypertext is a type of hypermedia, i.e. any hypermedia is an extension of hypertext. If hypertext takes only hyperlinked texts, hypermedia is a combined collection of hypertext, graphics, photos, video, audio and other formats. Therefore, hypermedia is a relatively

broader concept than hypertext. It is considered a path to hypermedia. Hypertext refers to the management of information related to plain text, and hypermedia refers to linking hypertext using various formats.

Hypermedia is considered as a method of understanding multimedia. That's because it expands the material in text, photo, video, audio and multimedia formats. As a result, the article will be different with the help of video, photos, graphics from other sources, and it will show the appearance of multimedia content. Multimedia material is a combination of content formats such as text, audio, photo, graphics, animation and video. Multimedia provides a combination of semantic, structural, and other formats of hypermedia and interactivity.

Each variety of hypermedia consists of different spaces, and the process of merging with multimedia is an important aspect of multimedia treatment. As a result, multimedia content appears as a new form of journalism. This increases the visibility of journalistic activity and significantly increases its effectiveness.

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Rezyume: *Maqolada gipermatnning rivojlanish jarayonlari haqida yozilgan. Ma'lumki, gipermatn hodisasi integratsiyasi gipermatn va multimediaga asos bo'ladi. Ushbu jarayonlar bir biriga uzviy bog'liqlikda rivojlanadi. Uni internet jurnalistikasi amaliyotida o'rganish muammoni aniqlashda yordam beradi.*

Резюме: *В статье описаны процессы развития гипертекста. Известно, что интеграция феномена гипертекста лежит в основе гипертекста и мультимедиа. Эти процессы развиваются во взаимосвязи друг с другом. Изучение их в практике интернет журналистики поможет выявить проблему.*

Kalit so'zlar: *gipermatn, gipermedia, multimedia, audio, video, grafikalar, matn, gipermatnli material, formula.*

Ключевые слова: *гипертекст, гипермедиа, мультимедиа, аудио, видео, графика, текст, гипертекстовый материал, формула.*

FOREIGN EXPERIENCE OF SMALL BUSINESS SUPPORT

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Summary: *This article analyzes the foreign experience in supporting and regulating small businesses. Additionally, it identifies the criteria for classifying small enterprises into various categories in different countries. Differences in defining the small business sector exist even among EU countries and US states, which do not always positively impact the maintenance of competition in the small business segment, creating additional obstacles for businesses within a single country or union of states.*

Key words: *small business, small enterprises, state regulation, state support, advantages and disadvantages of small business, foreign experience.*

International experience in the development of small businesses demonstrates that this business layer is extremely significant in the national economy. The means to increase the share of small businesses in the economy is a system of incentives. Abroad, stimulating small businesses includes quite costly support measures such as:

- tax benefits;
- preferential loans and loan guarantees;
- staff training and easier access to information;
- intellectual property protection;
- non-repayable subsidies for scientific and technical programs (Japan);
- funding for scientific research;
- protection of interests in public procurement [3].

Thus, the state assumes part of the costs of small businesses. The experience of countries like the USA, Japan, and Germany is the most interesting given the successes achieved in the development and effective management of the small business segment.

In the USA, since 1953, there has been a law supporting small businesses, and at the same time, the Small Business Administration (SBA) was established. Key areas of competence are consulting, contracting, and lending. The SBA is authorized to make direct loans at the expense of the state. The most popular and in-demand program is lending under government guarantees. According to the program's conditions, the borrower covers 10% of all expenses, while all other costs are assumed by the bank or other credit institution under a 100% SBA guarantee.

Under the provisions of the 1953 law, at least 23% of all government contracts must be awarded to small businesses. The SBA strictly monitors compliance with this proportion and oversees the public procurement program.

As a form of state support, the US has the Small Business Development Center Program, adopted in 1980. Centers are established at educational institutions in the USA and serve as a kind of school for training future entrepreneurs, where volunteers from among college and university students, as well as teaching staff, provide management advice, technical and legal assistance in starting small businesses.

An important feature of business in the USA is the widespread use of franchising. This solution makes it much easier to start a business [4].

Among European countries, Germany is the most advanced in the level of small business development – there are 3.5 million people engaged in entrepreneurial activities in the country, accounting for 4.2% of the total population, with the share of income from entrepreneurial activities constituting 57% of the total GDP.

Any native of Germany who decides to start a business can obtain a preferential state loan of up to fifty thousand euros for twenty years. For the first two years, the entrepreneur can use the funds free of charge. For the next eight years, they only need to pay preferential interest – annually.

The actual loan amount must be repaid only from the eleventh year. In addition, the German government reimburses up to 40 thousand euros for various research and scientific work.

The amount of investment in the development of small businesses in Germany constitutes a significant portion of the state's total financial investments. Small organizations annually take loans from the state amounting to 50 billion euros.

In Germany, a notable place is occupied by the "Program for Innovative Support of Small Entrepreneurship," aimed at the development of research and development (R&D) by small business enterprises in collaboration with scientific institutions. Germany's experience in involving high school and university students in entrepreneurial activities is also noteworthy. The German government, in cooperation with the central bank, implements a program to financially support and stimulate student entrepreneurship. Over the past years, this program has yielded results – more than 350 new innovative enterprises have been created in the country.

In another European country, the United Kingdom, the highest level of registered entrepreneurs as a proportion of the total population is observed, meaning nearly one in eight people is engaged in business. Small business in the United Kingdom has a significant impact on the country's economy, accounting for 55% of the total GDP [1].

The state's fiscal policy plays a significant role in the development of small businesses. Government incentives, such as establishing a reduced tax rate for small organizations, deferred bill payments, a rational system of discounts for overdue loans, and property tax reliefs, allow small businesses to remain solvent and develop their operations.

In developed countries, R&D is represented by four main institutional sectors: public, private, non-profit (research institutions and organizations that are virtually non-profitable and thus tax-exempt), and universities.

In developed countries, the duration of the innovation process is 5-6 years, while in medium-developed and developing countries, it is 15-25 years. The cost-effectiveness of R&D in small innovative firms in the USA is four times higher than in large corporations. Moreover, small innovative businesses create 2.5 times more innovations per employee and implement them one year faster than large businesses, spending 75% less money.

In Germany, small innovative firms spend about 6.1% of their turnover on R&D. In Japan, in the mid-1990s, the share of small and medium-sized firms conducting R&D was 22% (compared to 10% in the 1980s), and this indicator is expected to reach 38% in the coming years, according to experts [2].

Cooperative relationships involving small innovative businesses arise in areas such as:

1. Grant provision to small innovative businesses (from universities, corporations, etc.);
2. Technology transfer to small firms (by research institutions, corporations, etc.);
3. Joint R&D and project implementation (with universities, corporations, and among small firms themselves).

Small innovative businesses have significantly developed within the framework of innovation infrastructure (technoparks, technopolises, innovation centers, venture funds, etc.), specially created by the state to intensify the innovation process. In France, it is planned to create 31 incubators, 10 of which are already operational. In these incubators, small firms receive premises and equipment for 2-3 years free of charge, during which the project must be developed.

In Belgium, the innovation process is stimulated by "cluster policy" (unity of institutions and enterprises). In the process of technology transfer, both scientists and students are involved. In Flanders, there is an investment law that channels budget funds for technology transfer through universities and research institutes. Up to 150 million euros from the scientific and technical budget is allocated to promote results in industry. Innovation incentives for companies include interest-free loans and subsidies, which can reach 25% of the cost. As a result of this policy, there is a high percentage of employees in the knowledge-intensive sector: 9% compared to 4.4% on average in the European Union [3].

The increasing importance of small innovative businesses is associated with several patterns:

1. Small business structures are more focused on R&D as they are primarily engaged in the development of innovations rather than their industrial application;
2. They perform certain functions of the innovation process with lower costs and in shorter time frames;
3. They possess advanced information and computer technologies, are more efficiently organized and managed, allowing them to conduct high-level research;
4. The flexibility and smaller scale of projects allow for cost reduction and risk minimization, with sufficient R&D funding due to the high profitability of implemented projects;
5. Due to their size and mobility, these structures easily integrate into cooperation systems among themselves and with large companies, are capable of implementing the riskiest projects, and actively cooperate with research and innovation centers and universities;
6. The flexibility of small firms is due to the possibility of rapid technological and research reorientation, better adaptability to changes in the socio-economic situation, and simplified internal communications;
7. Small innovative businesses easily emerge in new industries with free markets, leading to the creation of new economic segments.

The development of small innovative businesses has significant social effects. Venture financing includes mechanisms for distributing ownership of newly created firms. This stimulates entrepreneurial activity and leads to increased income for the population (especially those employed in science and innovation, which attracts highly qualified personnel to the innovation sector).

Foreign experience in organizing innovation processes shows that the scientific and technical policy of developed countries pursues two main goals: preserving and transforming regional science in the interests of specific regions and prioritizing funding for applied research. The key aspect of state policy in these countries is the implementation of a set of legislative and organizational measures aimed at creating and maintaining an "innovation climate" in the country. At the regional level, the peculiarity of creating an infrastructure that supports innovation development is primarily its orientation towards the region's profile industries, development priorities, complementarity of firms, and maximizing the advantages of the region.

There are direct and indirect methods of state regulation of innovation activities. Direct methods of economic regulation typically include:

- state investment in the form of funding (targeted, subject-oriented, problem-oriented), lending, leasing, stock operations;
- planning and programming;
- state entrepreneurship.

A special place in the system of direct economic impact of the state on innovation processes is occupied by measures that stimulate the cooperation of industrial corporations and universities with industry.

Indirect methods of regulating innovation activities abroad are mainly aimed, on the one hand, at stimulating innovation processes, and on the other, at creating favorable economic conditions and a socio-political climate for scientific and technical development. They are based on the fact that the state does not directly limit the autonomy of enterprises in making economic decisions. Among the indirect management methods, the following are traditionally distinguished:

- tax and depreciation regulation;
- credit and financial policy;
- price regulation;
- protectionism policy;
- liberalization of tax and depreciation legislation.

In the USA, it is characteristic to see rapid development in government procurement from small firms for specific innovative projects or for providing scientific and technical services. Additionally, in the USA, the Small Business Administration guarantees up to 90% of loans provided by commercial banks to small enterprises.

The European Union set a goal to bring its economy to the forefront through innovation by 2015. This should be achieved by encouraging entrepreneurship, promoting innovation, gaining results from the implementation of advanced technologies, and developing sectoral programs. The European Commission aims to improve the interaction of innovation policies among EU countries, reduce the gap in socio-economic development levels between northern and southern regions, standardize regulatory frameworks in the area of innovation promotion, simplify the procedure for creating new companies, and ensure a positive fiscal policy for newly created firms and venture capital.

In Germany, the conditions for grants for scientific research and the training of research personnel are legally established. The Program for Stimulating Cooperative Innovation Projects has been adopted, supporting the cooperation of small firms with public and private research institutions.

In Italy, the Fund for Technological Innovations has the right to provide preferential loans for a term of 15 years, with 80% of the amount disbursed during the implementation of the program and 20% at its final stage. In France, temporary exemptions from income tax or partial reductions ("tax holidays") are granted to newly established small and medium-sized firms (including research ones), with a 50% reduction in income tax for the first 5 years of their activities.

In the United Kingdom, tax incentives for small enterprises allow for a 20% reduction in taxable income if the previous maximum level of R&D expenditures is exceeded, or reduce tax payments by 6% of the research and development expenditures, provided that the reduction does not exceed 15% of the firm's tax obligations. Expenses incurred by firms in payments to research institutions for scientific and technological development can also be deducted from taxable profits [4].

In Japan, among the government measures to ensure scientific and technological progress and stimulate high-tech industries, regional development programs play a prominent role. One of them is the "Technopolis" program, aimed at creating scientific-industrial towns where favorable conditions for the organic merger of research activities with high-tech production are ensured.

The interest of corporations and the government in the development of small innovative businesses has led to the mass formation of small business structures in developed countries worldwide. The total number of small business structures (including innovative ones) is 19.3 million in the USA, 6.45 million in Japan, 2.63 million in the UK, 2.29 million in Germany, and 1.98 million in France. In this sector, 39.5 million people are employed in Japan, 70.2 million in the USA, 13.6 million in the UK, 18.5 million in Germany, and 15.2 million in France. In the small business sector (including innovative ones), 52-55% of GDP is produced in Japan, 50-52% in the USA, 50-53% in the UK, 50-52% in Germany, and 55-62% in France [5].

Summarizing the experience of small innovative businesses in the economies of highly developed countries, several conclusions can be drawn for Uzbekistan: developing infrastructure for innovative startups, including technoparks and business incubators; ensuring access to modern technologies and resources for research and development (R&D); introducing grants and subsidies for innovative projects; developing tax incentives and stimuli for innovative enterprises; developing partnership programs between universities and small businesses for knowledge and technology transfer; implementing educational programs aimed at developing entrepreneurial and innovative skills; creating venture funds and startup support programs; attracting foreign investments in innovative projects; facilitating access to domestic and international markets for small innovative enterprises; supporting export activities through assistance and marketing programs; simplifying business registration and operation procedures; protecting intellectual property and ensuring patent and trademark rights; developing training and skill enhancement programs for employees of small innovative enterprises; creating conditions for continuous professional development; developing platforms and portals for information and experience exchange among entrepreneurs; organizing consultancy centers to support innovative startups at various stages of development; participating in

international programs and projects aimed at innovation development; establishing ties with foreign partners for experience and technology exchange.

These conclusions can contribute to creating favorable conditions for the development of small innovative businesses in Uzbekistan, which, in turn, will stimulate economic growth and enhance the country's competitiveness on the global stage. Thus, the analysis of foreign experience in stimulating the development of small entrepreneurship implies identifying essential elements for the processes of renewing the national economy and its confident integration into the global community.

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Rezyume: *Ushbu maqolada kichik biznesni qo'llab-quvvatlash va tartibga solishning xorijiy tajribasi tahlil qilinadi. Bundan tashqari, kichik korxonalarni turli mamlakatlardagi turli toifalar bo'yicha tasniflash mezonlari belgilanadi. Kichik biznes sektorini aniqlashdagi farqlar hatto Evropa Ittifoqi mamlakatlari va AQSh Shtatlari orasida ham mavjud bo'lib, bu har doim ham kichik biznes segmentida raqobatni qo'llab-quvvatlashga ijobiy ta'sir ko'rsatmaydi, shu bilan bir mamlakat yoki davlatlar Ittifoqi ichidagi biznes uchun qo'shimcha to'siqlar yaratadi.*

Резюме: *В данной статье анализируется зарубежный опыт поддержки и регулирования малого бизнеса. Кроме того, определяются критерии классификации малых предприятий по различным категориям в разных странах. Различия в определении сектора малого бизнеса существуют даже среди стран ЕС и штатов США, что не всегда положительно сказывается на поддержании конкуренции в сегменте малого бизнеса, создавая дополнительные препятствия для бизнеса внутри одной страны или союза государств.*

Kalit so'zlar: *kichik biznes, kichik biznes, davlat tomonidan tartibga solish, davlat tomonidan qo'llab-quvvatlash, kichik biznesning afzalliklari va kamchiliklari, xorijiy tajriba.*

Ключевые слова: *малый бизнес, малые предприятия, государственное регулирование, государственная поддержка, преимущества и недостатки малого бизнеса, зарубежный опыт.*

DEVELOPMENT OF CREATIVE THINKING OF STUDENTS IN ARCHITECTURE LESSONS

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Summary: The article discusses the use of Eastern educational traditions in the classes of engineering graphics and construction architecture, the development of students' spatial thinking, the presence of mutual cooperation in the educational process, the teacher encourages the student to independently perform graphic work and encourages students to be creative.

Keywords: Architecture, drawing geometry, education, expert, student, creative thinking.

The analysis of socio-economic changes in the country, the sharp developments in society, is increasing the demand for mature individuals who can solve life problems in unconventional ways. In situations such as setting a goal and finding a solution, modern youth are required to have the skills to make independent decisions. Therefore, the task of educating the student's personal activity and developing creative qualities is one of the main problems in the education system.

It requires the development of various educational ideas and technologies aimed at developing the creative capabilities of the growing generation, as well as their application in pedagogical theory and practice, in harmony with the innovative process taking place at the modern stage of the direction of modernization of education. In order to find a solution to this task, the role of higher education institutions is very important, which serves to increase the knowledge of students, develop their initiative and independence, show creative activity, form practical skills and abilities, educate their artistic tastes, and awaken their unique features such as fantasy, imagination, and sense of existence.

Creative activity develops as a result of effective use of creative activity of students in the organization of the educational process, assimilation of the system of knowledge, qualifications and skills in accordance with certain psychological and pedagogical conditions. The quality of professional training of future specialists depends on their creative activity, such as the demand for knowledge, the breadth and variability of their thinking, the pursuit of creative achievements, the effectiveness of creative activity, the development of various methods for finding a solution to a task depending on changing conditions, and the ability to anticipate the development of activity.

The sense of beauty develops and is brought up from childhood. This education begins even before school, in the family in the process of communicating with nature, books, and continues at school in other educational institutions, where a deeper perception of beauty is formed. The beautiful exists not only in nature and art, but also in life and work. However, art has made the beautiful the subject of its comprehension, research acquaintance with the basics of fine literacy, with the history of fine arts begins at school lessons.

The success of teaching fine arts depends on many conditions. Encounters with art at every lesson is teaching the younger generation to see the beauty in life and art, the active creative activity of each student, the general joy for what has been done in the classroom - this is the main distinguishing feature of the educational process. The little man looks at his teacher with trusting, wide eyes. His sensitive heart at any moment is ready to respond to the beautiful, colorful world, which he saw in the fine arts in a new way.

The earliest traces of the human mind can also serve as a means for a comprehensive, including scientific education and spiritual education of the younger generation. So rock graphic images of primitive people have survived to our times. Such images can be seen on the banks of the Yenisei River, Kazakhstan, Altai and in some cities of Uzbekistan. The scientist and educator of Central Asia, Abu Raykhan Biruni, applied the projection method in his scientific works and widely used it in practice when making drawings.

It is known that he paid great attention to projections (views) in the drawings and came to the following conclusion: "An animal mentally placed inside a cube has six main views - front and back, right and left, top and bottom." Drawing tools Abu Rayhan Beruni himself made according to his own drawings and used them to carry out his scientific research. In the Middle Ages, when classical culture went into a stagnant period, image methods also ceased to develop. And only in the fourteenth and sixteenth centuries, during the Renaissance, a new era in the development of image methods came. The discipline "Descriptive geometry" consists of four parts: orthogonal projection, axonometric projections, projections with numerical marks, perspective. In addition, for a more perfect image, shadows are used. A radical historical turning point in the development of the theoretical and practical aspects occurred towards the end of the 18th century.

The great French scientist Gaspard Monge, having generalized the existing laws of projection, developed the method of orthogonal projection of figures on a plane and the method of projection onto two mutually perpendicular planes. In the process of the study on the organization of classes using the traditions of Eastern teachings in the lessons of engineering graphics and building architecture, the following positive results were achieved:

- The direct connection between memory and attention increased;
- Development of spatial thinking of students;
- In the learning process there is mutual cooperation;
- The teacher determines and evaluates the level of knowledge;
- The teacher directs the student to independently perform graphic works;
- The teacher calls for independent work;
- The teacher encourages students to be creative, study special literature, teaching aids, electronic textbooks and use modern information technologies.

Joint work in the course of classes gives the student the opportunity for an individual approach to the study of knowledge and events. It is proved that the activation of students' activity, increasing their spatial thinking on the basis of the traditions of oriental architecture in the classroom on the subject of descriptive geometry effectively affects the learning process. It is known that a lot of ancient fundamental handwritten works of scientists and educators of the East have not yet been fully studied. The study and analysis of these works that have come down to us opens up unlimited opportunities for the education and training of highly professional personnel.

Pride in the masters and their creations that have come down to us is embedded in our mental mind. Having studied the heritage of the masters of the great past, future specialists will master deep and lasting ones. With the modern rapid development of science and technology for solving problems in descriptive geometry, the use of digital technology, the performance of various graphic works, the use in practice of such a discipline as descriptive geometry in various fields of science, increases the efficiency of the task.

Training highly professional and competitive experts in their field is our main goal. For example, the image of objects requires knowledge regarding the spatial representation of this object, methods for the graphic execution of drawings. Without this knowledge, a person will not be able to translate his ideas on paper.

The application of the traditions of oriental architecture in the classroom on descriptive geometry considers the following tasks:

- The study of the theory and practical application of the projection of spatial objects onto a plane.
- Reading construction drawings (images).
- Teaching methods for solving spatial and constructive problems and depicting them on a plane.
- Development of spatial thinking in students.

In the process of learning the traditions of oriental architecture, such qualities as patriotism, love for the motherland, pride, respect for the rich heritage of our ancestors, masters and educators,

who have made their invaluable contribution to the development of national and world culture as a whole, develop.

Another example of the uniqueness of national architecture is that the study of some domes of ancient monuments from a biogeometric point of view: when building the domes of the famous monuments of Samarkand, Bukhara and Khiva, it can be assumed that the architects of antiquity took these forms from nature.

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Rezyume: *Maqolada muhandislik grafikasi va qurilish arxitekturasida darslarida Sharq ta'lim an'analaridan foydalanish, o'quvchilarning fazoviy tafakkurini rivojlantirish, o'quv jarayonida o'zaro hamkorlikning mavjudligi haqida so'z boradi, o'qituvchi o'quvchini grafik ishlarni mustaqil bajarishga undaydi va talabalarni ijodkorlikka undaydi.*

Резюме: *В статье говорится об использовании восточных образовательных традиций на занятиях по инженерной графике и строительной архитектуре, развитию пространственного мышления учащихся, наличии взаимного сотрудничества в учебном процессе, учитель помогает ученику самостоятельно выполнять графические работы. поощряет и мотивирует учащихся к творчеству.*

Kalit so'zlar: *Arxitektura, chizma geometriyasi, ta'lim, mutaxassis, talaba, ijodiy fikrlash.*

Ключевые слова: *Архитектура, геометрия рисунка, образование, специалист, студент, творческое мышление.*

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THE CONCEPT OF HYPERMEDIA IN JOURNALISM

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Summary: *In the article, the creative features of hypertext in Internet journalism and its scientific-practical concept were created based on the analysis of materials published on leading websites. In our opinion, hypermedia is a creative-technical phenomenal and historical phenomenon.*

Keywords: *Hypertext, hypermedia, journalism, concept, hypertext, material, multimedia, discursive, creative hypertext.*

From the middle of the 1990s, the peculiarities of web journalism as a discursive material began to be learned in foreign science. Specific features of blind hypertextuality, interactivity and multimedia discursive quality were defined (Machado, Palacios, 1996). And in 2004, Palacios began researching the service of hypermedia in creating news on mobile devices. Scientist has already tried the multimedia files of hypermedia as an example of the materials published in the Internet editions of the city. Since then, the work of learning it from a journalistic point of view, using examples of materials, has begun. However, this does not mean that there were no prior efforts to explore hypermedia. The reason is that T. Nelson, who introduced the term, created its unique scientific characteristics and gave its etymology. To this day, this definition is accepted as the initial scientific theory of the concept.

In recent years, the terms multimedia and hypermedia have been frequently used in Internet journalism. In particular, hypertext and hypermedia phenomena are characterized by a new structure, type of text, method of expanding material. The concept of hypermedia based on hypertext was used in 1965 by T. Nelson. In this example, the author mentions it in his section "Composite Information Processing: Variable and Ambiguous File Structure". According to him, hypermedia is "... a technology that processes, systematizes and integrates information into its elements with the help of hyperlinks" [1]. In our opinion, this hypermedia is understood as more technology. In fact, hypermedia is not a technology, but a new type of journalistic ethics. This news illustrates the multi-step process of information delivery. Each program delivers a multi-click message from various countries and media. T. Nelson should be considered as the opposite of hypertext and hypermedia. However, the subsequent development of hypertext and hypermedia has a broader and infinitely more arbitrary nature than the meaning of these terms explained by T. Nelson.

Therefore, the requirements of the society, using the opportunities of journalism as a social institution, turned hypertext and hypermedia from a technical invention into a meaningful social event. And this process applies not only to hypertext, hypermedia, but also to radio and television.

Returning to T. Nelson, the researcher makes a theoretical overview of hypermedia in relation to the characteristics of hyperlinks, hypertexts as an abstract concept. In another document, it is stated that "hypermedia is an expanded hypertext that uses graphics, audio, video, text, and links to create a sense of a non-linear information area. "According to this theoretical point of view, hypermedia can be defined as a collection of hypertexts. Also, it is a related word to the multimedia style, a technology that is used to organize non-interactive information. "Hypermedia news is a branch of computer files connected by a system of links. The journalist builds this branch, it is called metahistory" [2]. Links allow the reader to choose. They are usually displayed by theme or reviews. When the audience clicks on it, a piece of text appears on the screen. As a result, the reader can refine the reading of the article according to his choice. The audience creates its own story and becomes a journalist and co-author.

Today, the technological determinism of many scientists is often used to connect the development of mass media with technological reforms. In this direction, Marshall McLuhan's name is on the first place in the world. Many people join the scientific argument that technology determines the development of mass media. And McLuhan is a scientist who supported the idea. From his point of view, any mass media is affected by technologies. They set the direction of appearance and development of journalism.

We believe that it is necessary to give a clearer understanding of M. McLuhan's position due to the misunderstanding of the business. In fact, the scientist is the author of the phrase "the tool itself is information" [3]. This is the reason to call it a more technological deterministic approach in science. But he misunderstood McLuhan. In this regard, M. McLuhan's opinion consisted of a broad and deep understanding of the possibilities of technology. In his opinion, technology has a unified effect. For example, sound on the radio or visuals on television. However, these effects have a social character in a broad sense. M. McLuhan's main goal is not technological determinism, but more clearly showing the interdependence of media.

Thus, journalism is both a journalist and a technician at the same time. These two points show the development of mass media. Journalist's accuracy is delivered to the audience with the help of technical actions and tools. In particular, in the course of Internet journalism, the technical trends that organize and shape the media are monitored. The author is forced to write the work according to automation and technical possibilities in the channels of social branches. As a result, the journalist in most cases conveys human-sized events to the audience. The impact of such technology is often observed in the media, especially in the Internet media. The technical sphere of influence of hypermedia was also defined in journalistic materials. That's why we believe that it plays a big role in solving the problem of learning in the nature of understanding, and in the nature of technology.

E. N. Yakubenko in his article "Convergence is the key to the modern mass media market" [4] distinguishes the modern convergent mass media into the following three types:

1. Victory media is one of the structural parts of the mass media system.
2. Hypermedia - publications that deliver content from various means at the same time. For example, offline and online newspapers. They are often called convergent.
3. Transmedia is the new media. Advances in this direction continue in science. The reason is that if those who don't recognize the difference consider them to be media, some people think that they are not media. For example, social branches, their content is not informational, but communicative, and secondly, it is improved more by users than by editors. The transition of transmedia resources from the limited scope of professional journalism and the expansion of their functions by solving a number of activities not related to the media, takes into account the relationship of social branches. In the classification of E. N. Yakubenko, hypermedia is considered as online publications that deliver content using various tools at the same time and use this feature. Here, the scientist proposes to call hypermedia as a type of media that deals with material in various formats. In our opinion, this opinion is not very good. The reason is that it is more suitable for multimedia journalism.

Therefore, there are two types of theoretical definitions in the science of hypermedia:

a) It is a theory of text expansion with the help of various multimedia tools (Pavlik, John, Sanavilhas J., Baccin A, Longhi, Raquel, etc.). Here we consider that the word tools is used in the sense of audio, photo, video, graphics. This is because hypermedia uses sound, video, text, and links. However, this does not mean that hypermedia is called multimedia. It should not be considered a complete hypertext system. It is a broader concept than hypertext. If hypertext connects texts in other space and space with links, hypermedia combines elements such as audio, video, graphics in text composition, that is, hypermedia is considered a path leading to multimedia.

b) The type of online publications that deliver hypermedia material to the audience using various tools (E. N. Yakubenko, H. Kalmikov, etc.). Although this scientific hypothesis [5] is not widespread in science, its conceptual characteristics are being discussed by different scientists.

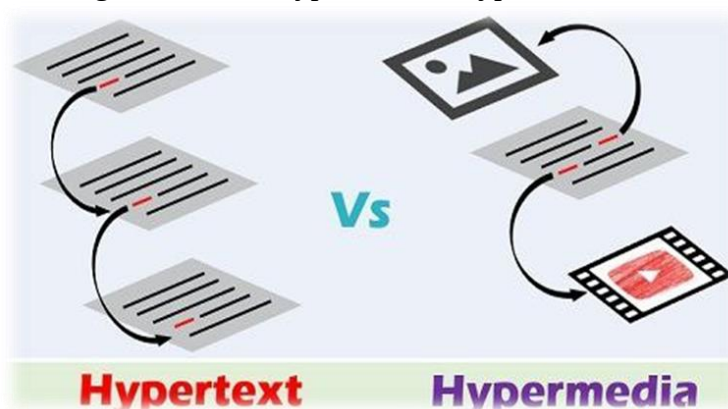
However, E. N. Yakubenko, H. Kalmikov considered it in the framework of their articles and listed it among other media classifications. In our opinion, the definition of hypermedia as a type of online publications needs to be further studied and reviewed with the help of clear examples.

The above two scientific definitions of hypermedia are very close to its characteristics, nature, and unique features. However, in science, compared to the concept of Internet publications, his service in expanding texts is widespread. In recent studies, more attention has been paid to the fact that hypermedia provides communication between texts and multimedia tools.

Here we can say that there are great ways to combine hypertext and hypermedia. For example, hypertext provides communication with the help of materials, and hypermedia files, more precisely, audio, graphics, videos provide connectivity with works. Let's look at the differences that help distinguish hypertext and hypermedia from each other with the help of a special table:

Hypertext	Hypermedia
Text in one or another document or text linked to its parts.	Texts move between media. This extension is not limited to text only, communication is not limited.
It is a group of texts connected by powerful interconnection tools called hyperlinks.	This type of text, photo, audio, video, and graphics shows the non-linear appearance of the composition.
This type of text, photo, audio, video, and graphics shows the non-linear appearance of the composition.	This type of text, photo, audio, video, and graphics shows the non-linear appearance of the composition.
Hypertext refers to the interaction between a person and a computer.	Hypermedia extends the use of multimedia elements to create links that students can access and interact with.
It compiles content from various media in electronic text format.	It combines hypertext and multimedia and offers multi-item information.

There are six categories that are not mentioned in the description of the differences between the two concepts. They are compared with each other based on the principles, functions, and appearances of the terms. We believe that it is necessary to see the following picture in order to understand the main meaning of the terms hypertext and hypermedia:



5.1.1. - Figure: Difference between hypertext and hypermedia environment

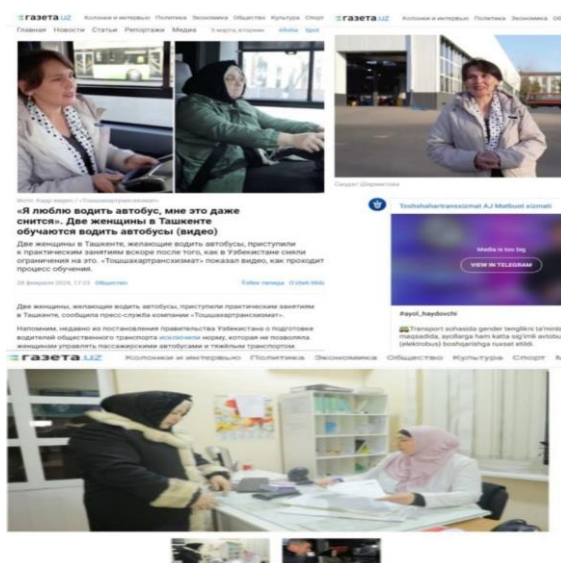
In the photo on the side of the first row, the texts are connected to each other, while in the photo on the right, multimedia elements are connected to the text. Hypertext and hypermedia are close to each other as communication services based on links. However, all the variety of views of the text is combined in space and time.

More hypertext is used on the sites www.kun.uz, www.daryo.uz, www.gazeta.uz, www.anhor.uz, www.bugun.uz. Among them, only www.qalampir.uz publication can collect hypermedia content. In it, the text connected with the video on the www.daryo.uz site by means of a hyperlink and caused the creation of hypermedia material.

28.02.2024. www.gazeta.uz: "I love driving a bus, I even dream of it." Two women in Tashkent learn to drive a bus (video)".

Formula: Text + photo + text + video + photo

Along with hypertext, hypermedia is also used in the material. However, at the same time, the use of hypertext and hypermedia in the material rarely increases.



5.1.2. - image: Hypermedia content

Currently, there are no scientific opinions related to the hypermedia method, as we said, they are different, and it is necessary to compare them with real examples on the sites. A theoretical definition of the term hypermedia is defined based on that. In the data, it is described as "hypertext-type multimedia information and the connections between them are collectively called hypermedia" [6]. Analyzing the author's point of view, hypermedia is a method of connecting hypertext and multimedia elements with mutual links. Hypertext has a narrower meaning than it, it establishes the connection between texts, and hypermedia describes the connectivity between texts, audio, photo, video elements. Hypertext is a part of hypermedia that has a quality that does not exist. He also includes hypertexts in his work. That's right, we can consider that hypermedia is an extension of hypertext, which includes multimedia such as photo, video, audio, and graphics. "Hypermedia is the next version of hypertext, where graphics, texts, audio, video and animated graphics are interconnected" [7]. More precisely, if hypertext provides inter-text communication through links, hypermedia includes links of multimedia elements leading to another destination. Some scientists evaluate hypermedia and multimedia as the same thing. The main reason for this is that hypermedia is different from itself, as multimedia elements connect photos, videos, graphics to text. However, this multimedia expansion is only a different destination, it has the potential to be united in the space of time, and there is no way to expand the text that is part of multimedia journalism in the same destination. In our opinion, both concepts are distinguished by their main functions and peculiarities in journalism. We believe that separating them from the journalistic point of view and learning them will help to create the theoretical basis of hypermedia.

№	Compare	Multimedia	Hypermedia
1	Mains	In the text, various forms of information are used (audio, photo, video, etc.).	The extension of hypertext also connects multimedia in other places, places, and time spaces.
2	Types	There are linear and non-linear types	It just has a non-linear appearance.
3	Connection	Together with hypertext, it creates hypermedia.	It combines both hypertext and multimedia in information dissemination.
4	Service	It works in mutual influence and interactivity.	It is used for mutual connectivity between elements.
5	Requirements	For this, a multimedia delivery system is required.	It offers links to expand the possibilities further.
6	General information	It is a combination of media and structure that store information in devices.	Its nature is more contrastive and linear, so it is used in the presentation of information.

In journalism, using the unique features of online media, news writing becomes hypermedia. The reason is that "it uses different communication models" [8]. According to different scientists, "it uses contextualization based on combining information" [9]. It states that "... hypertext and multimedia systems together affect the quality of online journalistic material" [10]. According to Pavlik's theory mentioned above, the methods of communication in hypermedia are even more extensive, that is, if hypertext combines texts only with links, hypermedia communication methods connect with calculated audio, video, graphics. As a result, the trend of "immersive education" [11] appears. We used the case-study method to study hypermedia in the contextualization of online publications in national media. For example, on February 28, 2024, on the website www.kun.uz, "Peasants' "movement": what are European farmers dissatisfied with?" the material is published. The content structure consists of hyperlinks connected to photos, videos, and text. Use various tools to deliver the article, and don't go to hypermedia. This basic material is expanding even more and allows the student to access information in various formats. Also, the audience's different attitude to the story encourages a deeper understanding with the help of other methods. In particular, the materials of the online newspaper "Globo A Mais", published in Brazil, were adjusted according to the hypermedia model.

Various multimedia elements are combined into the works written in the direction of culture, creating hypermedia content. Here, works in multimedia formats should not be confused with hypermedia. In multimedia content, photos, videos, graphics, animations are placed in the text itself, while in hypermedia, they are connected to other multimedia elements on the site with the help of hyperlinks. According to Larrondo Ureta, "... a method of managing various resources" [12]. It should be noted here that resources are used as multimedia elements. However, it was found that the content of hypermedia content is less compared to hypertext in the content of the leading sites in Uzbekistan that we have studied.

Today, due to the development of Internet journalism, the word format is used as an extended version of the concept of genre. According to my grandfather, there are scientific experts among the scientists. Their differences consider that it is necessary to call the materials that have changed from the content point of view as a genre, while some of them believe that it is more appropriate to call the articles that are differentiated from the form point of view as a format. In our opinion, the conceptual format is related to the fact that the content changes from the form side to the material. This is because the majority of materials in Internet journalism differ from each other in terms of structure or form. They serve as form zazaʻy. Therefore, if we take into account the nature of the extended service of hypermedia, it is not appropriate to emphasize its genre difference. There is no genre term. However, in journalism, hypermedia has certain format characteristics.

The hypermedia system perfects the convergent format by combining the multimedia in a different location and space to the text, that is, the text is combined with a photo or video and turns into a convergent format with the help of connecting different genres or formats.

In short, hypermedia means that information in a multimedia format can be combined with links to text, and it enriches the user experience and makes navigation more intuitive. Although it is functionally similar to the concept of hypertext, it differs in terms of performance and extension. That's right, hypermedia has the ability to include links to all types of multimedia objects, it combines both hypertext and multimedia in the presentation of information. This term refers to the non-linear presentation of text, photos, audio, video, and graphics. In modern media, hypermedia is described as a technical tool. In particular, his service to extend the material through various scenes is valuable. And the structural and semantic effect on the context is considered to be its distinctiveness. It is possible to create converged content by combining audio, video, graphic formats for a reliable audience. Also, the student can receive the material in various formats in the way he wants. In this part of our dissertation, it is necessary to mention the possibility of its transition to a convergent format from a journalistic point of view.

It was found that hypermedia materials are less used than hypertexts in the national segment at present. We published them on www.qalampir.uz and www.gazeta.uz websites. Internet

publications in Karakalpakstan have few hypermedia materials. This means that all necessary works are already performed in this shipment. Therefore, it is an extension of hypertext and performs the service of interlinking text and multimedia elements.

Hypermedia is a method of combining various formats of information. Instead of being limited to one type of text or visual CSI, hypermedia allows to include audio, video, animation and other multimedia elements in one text. Such connections facilitate the understanding of information and allow the audience to learn about different aspects of the topic.

We characterize the concept of hypermedia as follows. In the informational life of the society, the media occupy an important place. In the future, mass media information is merging with hypertext. Hypertext and media together form hypermedia. Therefore, hypermedia is about to become a new non-existent format of the ISS, which is constantly developing in the information society.

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Rezyume: *Maqolada etakchi veb-saytlarda chop etilgan materiallar tahlili asosida internet jurnalistikasida gipermatnning ijodiy xususiyatlari va uning ilmiy-amaliy konseptsiyasi yaratildi. Bizningcha, gipermedia ijodiy-texnik fenomenal va tarixiy hodisadir.*

Резюме: *В статье на основе анализа материалов, опубликованных на ведущих сайтах, созданы творческие особенности гипертекста в интернет журналистике и его научно-практическая концепция. На наш взгляд, гипермедиа – это творчески-техническое феноменальное и историческое явление.*

Kalit so‘zlar: *Gipermatn, gipermedia, jurnalistika, kontsept, material, multimedia, diskursiv, ijodiy gipermatn.*

Ключевые слова: *Гипертекст, гипермедиа, журналистика, концепт, гипертекст, материал, мультимедиа, дискурсивный, творческий гипертекст.*

REFLECTION OF COLLECTOR NETWORKS OF THE IRRIGATED TERRITORY OF THE ZERAFSHAN RIVER BASIN ON GIS MAPS AND THEIR HYDROLOGICAL AND HYDROCHEMICAL CHARACTERISTICS

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Summary: At the beginning of the article there are three maps of water bodies of the river basin. Zeravshan with a separate image of them for the Samarkand, Navoi and Bukhara regions; these maps show existing reservoirs, large irrigation canals, as well as the location of inter-farm and main collectors. The article, in separate tables for all main collectors for each marked area, provides data on average annual water flow rates, m³/s, volume of the collector article, in million m³ and the value of average annual salinity in g/l for 2018, 2019 and 2020.

Key words: swimming pool r. Zeravshan, Samarkandskaya, Navoiyskaya and Bukharskaya oblasts, map of water bodies, main collectors, consumption and mineralization.

In recent years, the hydrochemical state of river waters of the Republic of Uzbekistan in some areas continues to deteriorate. This is due to the fact that throughout the entire basin the rivers are recipients of various polluted runoff, including mineralized collector-drainage waters flowing from irrigated areas.

Currently, there is an urgent need to assess the hydrochemical state of the waters of various river basins of the Republic of Uzbekistan, including river basins located in the south of the republic. In this chapter, this problem is considered for the river basin. Zeravshan. Zeravshan is a transboundary river. Flowing over large areas, this river changes its water content and qualitative composition.

The irrigated areas of this basin are located within the Samarkand, Navoi and Bukhara regions. The total area of irrigated land is 778 thousand hectares. In this regard, a relevant and important task is to study the hydrological and hydrochemical characteristics of collector-drainage waters inside these massifs.

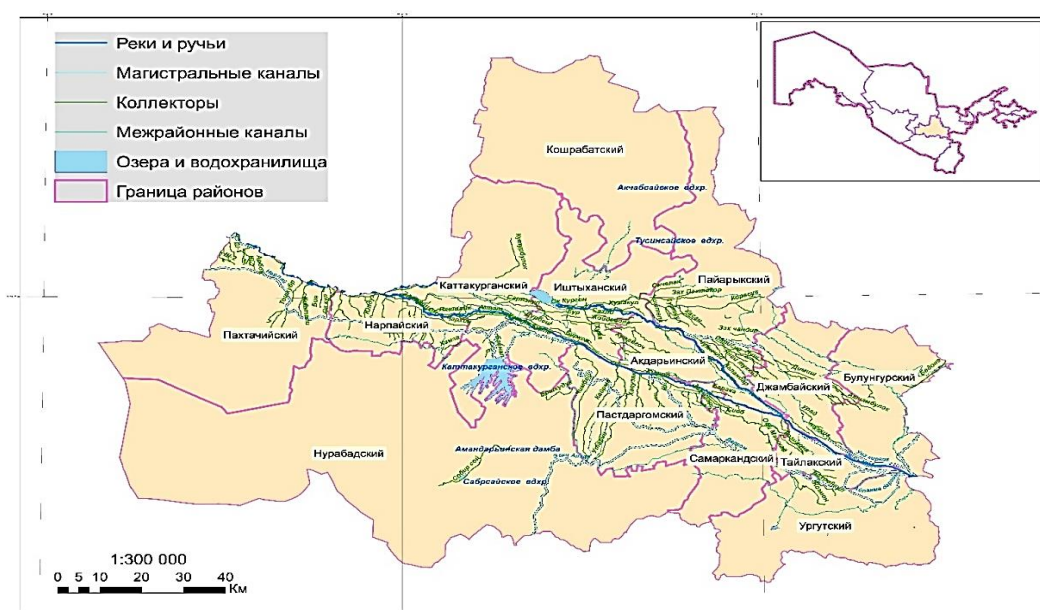
Various hydrological and hydrochemical characteristics of the collector-drainage waters of the basins under consideration were studied in different years by the following researchers: V. E. Chub; E.I. Chembarisov and others; B.E. Nishonov; T.P. Glukhova; T. U. Kudratov; Sh.O. Muradov; F.M. Rakhimbaev; A.U. Usmanov and others. However, their works do not sufficiently cover the issues of the modern hydrochemical regime of these waters. In the studies carried out, some positions of the basin landscape-halogenochemical method were used to study the dynamics of mineralization and chemical composition of river and collector-drainage waters.

In the studies carried out, some positions of the basin landscape-halogenochemical method were used to study the dynamics of mineralization and chemical composition of river and collector-drainage waters. The criteria for compiling monitoring maps of water supply and drainage systems of an irrigated area using GIS technologies are considered using the example of the basins under consideration. Based on the description of the water management features of the irrigated area, the following criteria can be identified for compiling monitoring maps of water supply and sewerage systems using GIS technologies:

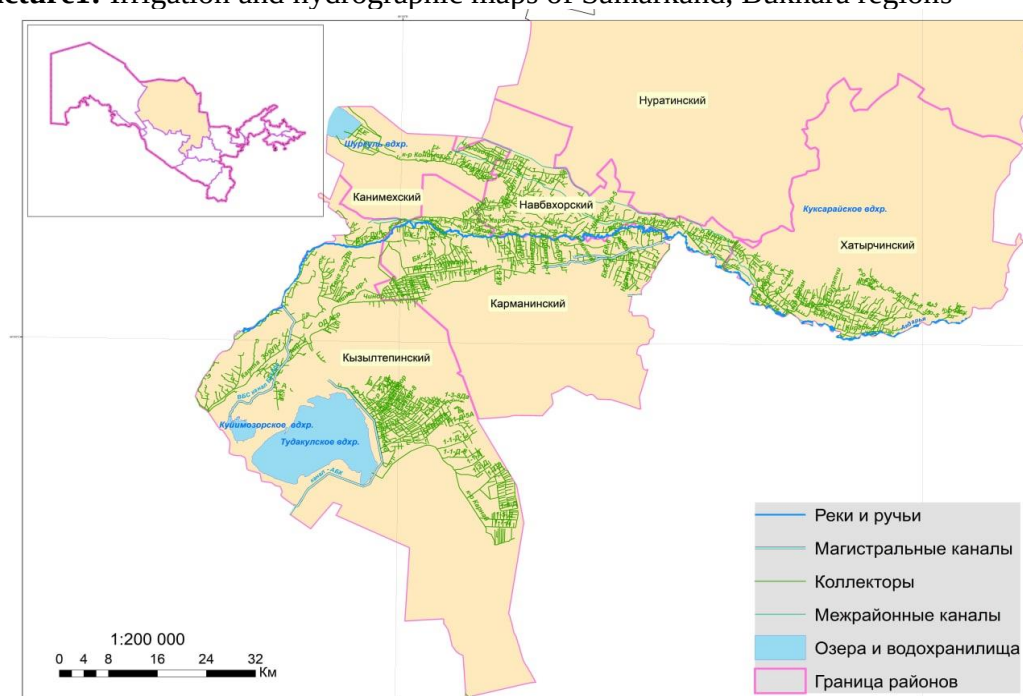
- map of the river network of the basin, indicating the main river and tributaries
- information on the size of river basins and the size of the drainage area;
- map of climatic characteristics of the river basin;
- the size of the irrigated area and the composition of cultivated agricultural plants;
- location of existing reservoirs and their characteristics;
- location of large irrigation canals and data on water flows in them;
- information on water intakes from the rivers of the basin as a whole for the massif;

- division of the river basin territory into geomorphological regions;
- location of existing representative hydrogeological wells with data on the depth and salinity of groundwater;
- location of large main collectors with data on their water flow, salinity and chemical composition;
- map of hydrological zoning of the river basin;
- map of hydrochemical zoning of collector-drainage waters indicating their volumes, average salinity and predominant chemical composition.

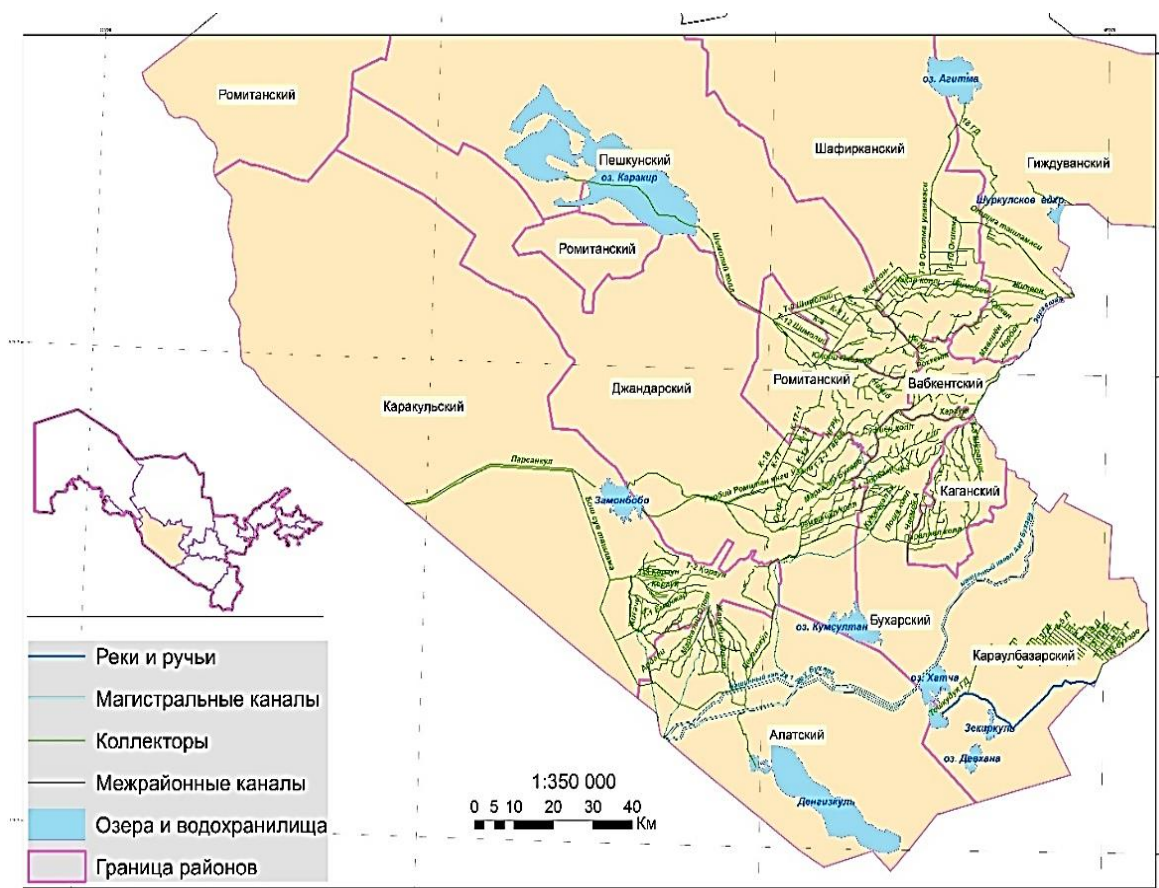
Based on the described criteria, the following GIS maps were compiled for the territory of the region under consideration: “Irrigation and hydrographic maps of the areas under consideration (picture 1), which indicate river basins, main collectors, lakes and reservoirs. These maps can be used for practical analysis of the state of water resources in the region under consideration.



Picture1: Irrigation and hydrographic maps of Samarkand, Bukhara regions



Picture2: Irrigation and hydrographic maps of Navoi regions



Picture3: Irrigation and hydrographic maps of Bukhara regions

The length of the collector-drainage network is as follows (in km): in Samarkand - 3904; in Navoiskaya -3130 and in Bukhara -8726 km; The corresponding collector flow values are 2.3 km³, 1.09 and 2.4 km³.

In the Samarkand region there are seven main reservoirs, a total of up to 0.59 km³ flows through them with a mineralization of 0.62-1.19 g/l, the composition is hydrocarbonate-sulfate-magnesium-sodium-calcium (HS-MNC). In the Navoi region there are also seven main reservoirs, a total of up to 0.89 km³ flows through them with a mineralization of 1.53-3.57 g/l, the predominant chemical composition is sulfate-calcium-sodium-magnesium (S-CNM). There are eighteen main collectors in the Bukhara region, a total of up to 2.33 km³ flows through them with a mineralization of 2.49-5.89 g/l, the predominant chemical composition is chloride-sulfate-magnesium-sodium (CS-MN).

Conclusions: - the existing water supply and water disposal systems of the irrigated area of the Zerafshan river basin were considered in compiling maps of water bodies in Samarkand, Navoi and Bukhara regions using GIS technologies, while the compiled maps reflected existing collector networks with indications of inter-farm and main collectors in each marked area;

- in the Samarkand region there are seven main collectors: United Karasuv, Siyob, Bedona, Kattarasuv, Karasuv, Utarchi, Khuzha. The highest water flow rates are observed in the Siyob collector up to 4.70-5.11 m³/s, the average annual mineralization varies from 0.74 to 0.81 g/l. In total, up to 589 million m³ of water flows out of the irrigated zone of the region through the listed collectors; - Navoi region also has seven main collectors: Ok-oltin-2, Markaziy, Narpay, Dul-Dul, Kanimekh, Katta Zavur, Urtabod. The highest water flows are observed in the Dul-Dul collector up to 7.46-9.05 m³/s, the average annual value of mineralization varies from 2.0 to 2.35 g/l, in total up to 893 million m³ of water flows through the listed collectors from the irrigated zone ;

- in the Bukhara region there are eighteen main collectors: Paralel-Dengizkul, Zhanutit, Bosh Karakul, Markaziy Bukhoro, Garbiy Romitan, Shimoliy. Parsankul and others. The highest water flows are observed in the Parsankul collector up to 28.01-33.25 m³/s, the average annual

salinity varies from 4.24 to 4.56 g/l, in total a year flows out of the irrigated zone of the region through the listed collectors up to 2328 million m³.

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Rezyme: Maqolaning boshida daryo havzasi suv havzalarining uchta xaritasi keltirilgan. Samarqand, Navoiy va Buxoro viloyatlari uchun ularning alohida tasviri bilan Zaravshon; bu xaritalarda mavjud suv omborlari, yirik sug'orish kanallari, shuningdek, xo'jaliklararo va asosiy kollektorlarning joylashuvi ko'rsatilgan. Maqola, har bir belgilangan maydon uchun barcha asosiy kollektorlar uchun alohida jadvallarda o'rtacha yillik suv oqimi tezligi, m³ / s, kollektor mahsulotining hajmi, million m³ va 2018 yil uchun g / l o'rtacha yillik sho'rlanish qiymati haqida ma'lumot beradi. , 2019 va 2020.

Резюме: В начале статьи приведены три карты водных объектов бассейна реки. Зеравшан с отдельным их изображением для Самаркандской, Навоийской и Бухарской областей; на этих картах показаны существующие водоемы, крупные оросительные каналы, а также расположение межхозяйственных и магистральных коллекторов. В статье в отдельных таблицах по всем основным коллекторам для каждого отмеченного участка приведены данные о среднегодовых расходах воды, м³/с, объеме коллекторного изделия, в млн м³ и значении среднегодовой минерализации в г/л за 2018 год. , 2019 и 2020 годы.

Kalit so'zlar: suzish havzasi r. Zaravshon, Samarqand, Navoiy va Buxoro viloyatlari, suv havzalari xaritasi, asosiy kollektorlari, iste'moli va minerallashuvi.

Ключевые слова: бассейн р. Зеравшанская, Самаркандская, Навоийская и Бухарская области, карта водных объектов, основные коллекторы, потребление и минерализация.

**THE ARTISTIC SIGNIFICANCE OF PORTRAIT AND LANDSCAPE DESCRIPTION IN
THE PROSE OF THE WRITER K. SULTANOV**

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Summary: *This article talks about the artistic significance of portraits and landscape images in the prose of the Karakalpak writer Karamatdin Sultanov.*

Key words: *portrait, landscape, narrative, image, prose, descriptive portrait, static portrait, portrait of a vestal, kinetic portrait, psychology of the hero.*

The artistic mastery of the author's editing in fiction, in his work, is a sign that each writer shows the uniqueness of editing. That is why, in this article, we are going to talk about the editing methods used in K.Sultanov's prose and short stories, and the issue of craftsmanship.

The author's illustrations are of great importance in the attractiveness of the work of art. These pictures are portrait, landscape, interior (to describe the place) and may be in other forms.

"The experiments in artistic literature show that creating a portrait is a compositional task. Writers have gone through a difficult path, as if they were able to accurately describe the appearance of their characters, like a real artist, and clearly show the same picture from the eyes of other people. Even if the portrait is made for the personal purpose of the writer, it will remain a mere tool without having an impact on the reader. And the portrait of the hero will be reliable only if the external appearance, movement, and inner spiritual world of the person are mutually connected" [1:136] - as the writer Z. Bekbergenova has shown, portraits are only useful if they serve artistically for the work. The thoughts and feelings of a person in the inner world of youth, joy and sorrows in the higher spiritual world are reflected in his natural appearance and facial expressions. Therefore, the writer K. Sultanov paid great attention to showing the changes in the appearance and behavior of the hero in his essays and stories. The reason is that "an artistic portrait is the most necessary art tool in depicting the hero, first of all, individuating the hero, making it memorable for a long time, reading and listening to it" [2:127]. Also, "Portrait plays a major role in creating the image of the hero - summarizing the character, thoughts and opinions of the hero in a single form. In works of art, character and feeling are clearly felt only when they enter the shell of a certain form - a portrait, and its aesthetic and emotional character is realized in a tangible form" [3:275]. A number of artistic functions were assigned to portraits in the creation of an artistic image under the leadership of K. Sultanov. For example, the use of out-of-plot portraits in the story "Conversations of the Elders":

«Two different guys are sitting by the door. They do not like the people of our village. One of them is a young man with a thin face and dark body. My father is talking to him.

The second one is a handsome boy with a yellow body and a mustache which has not appeared completely. No one can call this handsome boy, whose eyes are sparkling like diamonds, the younger brother of the guy next to him»[4:7-8].

This is considered to be an expository portrait of the characters, which was taken into the work before the beginning of the story. In the written work, he did not mention the names of these heroes, but first showed their faces and pictures. He writes the appearance of the characters in this portrait not on his own behalf, but one of the characters, who serves as the main character in the work, narrates from the language of Ospan. The heroes depicted in this portrait were Artyk and Sapiura. This is where the story begins with these depicted heroes. In this article, we can see the usage of such an expository portrait before the start of the plot.

There are important ideas about expository portraits in literature. Russian scientist M.N. Jornikova called exposure portraits as static portraits[5:14]. Young scientist, G.Allamuratov agreeing with M.N.Jornikova's opinion, calls the expository portrait a static portrait, and summarizes his own characteristics: "static portraiture pays more attention to the character's

outside. But he doesn't pay attention on his psychological excuses. A static portrait, like a dynamic portrait, consists of drawing a picture of the image at a certain moment, without describing the dynamics of the image, the texture of the plot. A characteristic feature of a static portrait is its focus on the main character. The author presents the main characters in the form of static portraits, the images that perform a clear poetic service in the work. [6:300].

G. Allamuratov notes that the portrait "is divided into two types according to the construction of the portrait in literary science: static and dynamic types" and about the dynamic portrait "a dynamic portrait not only mentions the distinguishing features of the hero, but also provides a plot line based on his gestures and movements, serves to connect the plots with each other" [6:300]. Here we fully agree with the author's opinion about the dynamic portrait.

Thus, in the work "Conversations of the Elders" discussed by the author, we will also see dynamic portraits related to the events. For example:

"He was shocked and he got goosebumps on his whole body. Even though I didn't see the fear, according to the stories of the elders, the wrestler's body of my grandfather Kurban, who was cursing the Khan with the old rope around his neck, and the thoughtful eyebrows of my grandfather Kabyl, reminded me with a soft body, smiling at the Khan... [4:81].

This portrait depicts the dramatic situation of the hero. The reader who reads this will also feel the feeling of being a "khan". The reason is that the author skillfully presented the dramatic situations by depicting the actions of the khan who oppressed the people, hanging Kabil on the gallows, and the curse of Kurban. Therefore, the emotional quality is strongly felt in this portrait. In addition, the dramatic situation shown in the portrait was the impetus for the beginning of the conflict. Khan's torture of Kabyl and Kurban, hanging him on the gallows arouses the anger of the people. As a result, there is a conflict between the people and the representatives of the Khan, and the events in the work are developing and maturing.

Such portraits were skillfully used not only in K. Sultanov's stories, but also in his essays.

Also, let's pay attention to the portrait of the main character Kosjeter in the writer's essay "My village":

"I know him from a young age. I still remember how this kind-hearted man took me on his boat and took me to see many lakes of Akdarya. I was amazed by the way his heavy fingers swept through a three-story pine cane, his small boat could not bear the stubborn force and covered the thick reeds like a morning, when he climbed the winding stream of the river, he fried the ground of the seasonal road, and he did not get nervous among the waves of the dark sea like a house [7:107].

Here the skill of the writer was to depict the appearance and psychology of the hero of the novel Kosjeter, not in his own name, but in the language of the character. This type of portrait is emphasized by J. Kaniyazova in her thesis work called "The Mastery of Character Creation in Sh. Seitov's Novels". The researcher Sh. Seitov analyzes the applicability of the portraits presented based on the characteristics of the writer and the portraits presented from the language of the characters, and the psychology of the characters is also presented in the context of the portraits [8:]. In the above example, as noted by J. Kaniyazova, the type of portrait is used, that is, it is depicted in relation to the impressions left by Kosjeter. In these pictures, the outer appearance and inner psychology of the hero are beautifully presented. For example:

«How do you think this year he will be forty three or forty five? Did wrinkles appear on his bright face, black body and did yellowish mustache like a pheasant feathers became white? May be his gentle black eyes were blown by the sea, and his fingers, which were as strong as a bell, had regained their strength. I wonder if he lost his desire to be a fisherman and became one of the crowds? No. He does not agree with one of the crowds. Even if the wave of the river of life passes over the body, he continues to rise. He does not follow the crowd. It is impossible to stay» [7:120] – in the portrait, Kosjeter's appearance is connected with his character, walking in front of the crowd in the fishing grounds, leading them, leading the fishing profession, and the goal he set for himself. In addition, in this portrait, the character and his appearance are connected, and the

reader has a wide opportunity to know what kind of person the hero is. The fact that the hero is an honest, professional countryman shines before the eyes of the reader. After reading the portraits, the reader gradually gets to know what the characters are like in the course of the work. It can be said that the addition of the image description is one of the artistic methods chosen by the writer.

The illustrated portrait painting is very close to the method of painting chosen from resin in the essay "Autumn in old Mulberry" written in 1956 by I. Yusupov. For example, "The towering appearance of the mulberry tree, like a double-edged tree, seems to be disappearing in the sunset of the autumn, as if the mulberry tree has lost its green structure, which it once grew, and now it is as if only the bone of the mulberry tree is left. A tree also loses its beauty when it gets old. The current of moment breaks its thick bark and falls into its roots as a worm. It no longer has the courage of its old age to fight against the eternal destruction of time, its branches are gradually drying up, and its thick leaves are thinning and turning yellow... Only a person can keep their beauty. The power to preserve it lies in the mind and heart of a person! These are two qualitative and powerful forces, if a person is able to serve a great purpose, he will become so artistic, so rejuvenated! ...»[9:6]. In this case, I. Yusupov creates a "portrait" of it, like a portrait of a person based on a picture of nature. Also, in both essays, the appearance of nature is connected with human life. If in K.Sultanov natural scenes (river waves) refer to a person full of strength, in I.Yusupov the condition (aging) of a mulberry tree refers to the age of a person. Comparing these two essays, it is not difficult to notice that the works of both authors are rich in landscape and portrait images, and poetry "flows" in their language. One of the main reasons for this can be considered that both of them are cheerful and have a good relationship. Secondly, in the growth of poetic skill in national prose, the leadership of the social factor is seen in their ability to see and feel true beauty and convey it using all the beauty of the artistic language.

The clothes he wears also play a big role in revealing the hero's character and social status. Clothing gives a chance to characterize the character in many ways. In the science of modern literature, the problem of connection between portraits and details has been extensively studied in the studies of G.V. Starikova, E.D. Schmidt, S.J. Tattimbetova [10:30]. They distinguish portrait details into somatic, vestial, and kinetic types. Somatic portraits are portraits created in relation to the body organs of the hero, vestial portraits are portraits related to clothes and clothes, kinetic portraits are portraits in which the changes that have occurred in the hero's psychology are reflected in his appearance and actions. Let's bring to mind Sapura, the hero of K. Sultanov's story "Conversations of the Elders". The external appearance of the writer Sapura is not given by the author's pictures, but it is skillfully depicted by the inner thoughts of the hero Ospan. For example:

«At one point, I noticed the curls on his hat. Getting off: "I found it!" – I thought, this young girl with a hat who has been pretending that she is not enough for me. Yes. This big hat like a lid does not suit for her white face, bright, shining forehead and lined dark eyebrows, beautiful eyes under the striped eyelashes, cherry red lips. Why did she wear it? According to her beauty would she wear a nice skullcap! If God says "I will give", then He will give beauty to boys as well! If she were a girl, everyone would be gelious to marry her to the other country»[4:9].

Details play an artistic role in this portrait. Even though Sapura wears a boy's clothes, Ospan's discription for her appearance and and mark for her face is evident to the reader by discribing her like a girl's beauty, and the hat (shogirme, men's hat) which is wearing is a girl. The reason is that the writer shows the hero dressed in a boy's clothes, and shows that her appearance can come to life in front of your eyes and as a result, the portrait of the main character is skillfully revealed. We can also mention that in the writer's story "Conversations of the Elders" kinetic portrait is one of the most frequently used methods. For example:

«Artik came out and began to look like a grain of wheat, burnt and oxidized by the scorching heat of the black sand. His body is not as small as before, his body began to be more stronger and stronger. The behavior of the young man who got into a fight with the servant also gained sense, took on a brave face, and became a bit elder» [4:57].

The Russian scholar G. Starikova explains that kinetic portraits provide the internal caches of the hero, voluntary and involuntary facial movements through words [10:73]. The portrait given in the example is skillfully painted in the author's own language. Along with creating such a portrait, the writer skillfully described the hero. He skillfully portrays Artik's hardships, burns in the heat of the sun, the changes in his appearance, and at the same time, the development of his intelligence, i.e. he creates a psychological portrait and gives a description of the hero. The skill of such an author to describe the characters has a great place in the development of the events of the story, in reaching a certain point of view. In the above example, the description of the hero based on an artistic portrait is given in the author's language, and in the continuation of the work, it can be seen that the description of the hero is given from the methods of creation, and one character's language is given to another character based on an artistic portrait. For example: "My father Egor came here with Russian friend. I know Egor from my youth. Even though he was young, the children started calling him "Egor Babay" because he grew his beard and mustache long. He only wears a hat on his head and a cigarette from his mouth, and he wears a black suit. Matvey fishes under the supervision of a rich man. There are many children" [4:48].

Characterization of such a hero to another hero based on an artistic portrait is artistically less important than the author's description of the hero. It is clear that K. Sultanov was able to skillfully use such a method in the right place.

Generally speaking, in the novels, essays and short stories of the writer K. Sultanov, the portrait is used to depict the hero's appearance, his mental state and behavior, and the landscape, along with the task of exposition, has an important artistic function in revealing the character of the hero and enlivening the events in the work. Based on the description of each natural scene, it is possible to understand the writer's aesthetic thought and artistic intention transformed into a poetic form. Therefore, K. Sultanov's landscape and portrait paintings in prose genres can be considered as a means of revealing the poetic content of thoughts about nature and people.

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Rezyume: Bu maqolada Qoraqalpoq yozuvchisi Karamatdin Sultonovning nasrida portret va manzara tasvirining badiiy ahamiyati haqida so'z etiladi.

Резюме: В данной статье рассматривается о художественном значении портретов и пейзажных образов в прозе каракалпакского писателя Караматдина Султанова.

Kalit so'zlar: portret, peyzaj, povesť, obraz, proza, ekspozitsiyalıq portret, statik portret, vestial portret, kinetikalıq portret, qahramon psixologiyasi.

Ключевые слова: портрет, пейзаж, повествование, образ, проза, описательный портрет, статический портрет, портрет весталки, кинетический портрет, психология героя.

FIGHT AGAINST DRUG ADDICTION OUR DUTY

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Summary: *This article analyzes specific features in the field of drug addiction prevention and control.*

Keywords: *Drug addiction, Social support, Legal Measures, medical services.*

Drug addiction is a really serious problem that affects many people around the world. It has devastating effects on health, family and society as a whole. Support for preventive measures and access to treatment is an important step in the fight against this negative phenomenon.

It is also important to note that drug addiction prevention begins with awareness. Information and awareness of the consequences of drug use, as well as available resources for help and recovery, play an important role in reducing the incidence of drug addiction. Creating a supportive and inclusive environment also contributes to successful drug rehabilitation. Ultimately, the unity and cooperation of the whole society is the basis for fighting drug addiction and ensuring the health and well-being of all its members.

Additional measures to combat addiction include improving the availability and quality of health care for drug addicts, including substitution therapy, needle exchange programs, and other services to reduce the risk of transmission. It is also important to adopt and effectively implement relevant legislation to control the illegal circulation of drugs and punish offenders. It is also important to conduct scientific research to understand the causes and mechanisms of addiction, which will help to develop more effective methods of prevention and treatment of addiction.

Other areas in the fight against drug addiction include developing alternative strategies to mitigate the factors that contribute to drug use, such as poverty, unemployment, and social and economic inequality. This may include programs to support vulnerable populations, including youth, refugees, the homeless, and others. It is also important to create opportunities for social inclusion and development so that people can find alternatives to drugs in their search for satisfaction and fulfillment.

Another important aspect of the fight against drug addiction is international cooperation. Because drug trafficking is often a cross-border phenomenon, coordination between countries is important in sharing information, developing joint operations, and upholding international agreements. It is also important to combat corruption and drug money laundering in order to stop the sources of funding for organized crime and terrorism.

Fight against poisoning. The fight against drug addiction is a set of measures aimed at preventing the spread of drugs, helping drug addicts recover, and preventing new cases of drug addiction. This fight includes the following aspects:

1. Prevention: providing information about the harm of drugs, conducting educational programs in schools and public places, developing alternative activities for young people.
2. Rehabilitation: providing drug addicts with access to treatment and rehabilitation, including medical care, psychological support, substitution treatment programs, and social reintegration.
3. Legal Measures: Enact laws to combat drug trafficking, punish offenders, and provide funding to combat drug trafficking
4. International cooperation: joint efforts of countries in the fight against drugs, sharing information, cooperation in investigations and conducting joint operations.
5. Social support: providing support to vulnerable populations, including the poor, the homeless, children with family problems, and others, to prevent them from using drugs.

The effective fight against drug addiction requires joint efforts of the state, public organizations, medical institutions, and the entire society. Additional efforts to combat drug

addiction include establishing open and effective needle exchange programs to reduce the risk of transmission, as well as counseling and support for families dealing with drug addiction among their members. 'may include support.

It also aims to prevent drug overdoses, including distributing noxalone (Narcan), a fatal opioid overdose.

It is important to develop cooperation between different sectors of society, including state bodies, public groups, medical workers and local communities, in order to create a comprehensive approach to combating drug addiction and its consequences.

Other important aspects of drug addiction may include:

1. Research: Support and conduct scientific researches to better understand the causes and mechanisms of drug addiction, as well as to develop new methods of treatment and prevention.

2. Community support: raising awareness and mobilizing communities in the fight against drug addiction, including organizing local initiatives and programs aimed at preventing the spread of drugs and helping those suffering from addiction.

3. Improving access to treatment: ensuring widespread access to quality and affordable drug addiction treatment services, including the development of early intervention and outpatient treatment programs.

4. Information campaigns: Conducting information campaigns and events aimed at raising awareness about drug addiction treatment and support methods, combating myths and stigmas.

5. Parent and Youth Support: Develop parent and youth support programs that focus on strengthening family relationships, developing parenting skills, and developing adaptive strategies for youth to cope with life stresses and challenges. Transfer

Of course, additional methods of combating drug addiction may include:

1. Promote healthy lifestyles: Promote healthy lifestyles, including physical activity, healthy eating, exercise, and other alternatives that can replace the lure of drugs.

2. Promote healthy lifestyles: Promote healthy lifestyles, including physical activity, healthy eating, exercise, and other alternatives that can replace the lure of drugs.

3. Psychological assistance: Development and provision of psychological assistance services for drug addicts and their family members, helping to overcome psychological problems related to addiction.

4. Innovative methods: use of new technologies and methods such as telemedicine, mobile applications to support treatment and rehabilitation, artificial intelligence to predict the risk of addiction and other innovative approaches.

5. Global coordination: cooperation and exchange of experiences between countries and international organizations to develop common strategies and actions to combat drug addiction at the global level

Each of these methods can contribute to an overall drug strategy and help create a healthier, safer community.

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Rezyume: Ushbu maqolada giyohvandlikning oldini olish va nazorat qilish sohasidagi o'ziga xos xususiyatlar tahlil qilinadi.

Резюме: В данной статье анализируются особенности в сфере профилактики и борьбы с наркозависимостью.

Kalit so'zlar: Giyohvandlik, Ijtimoiy qo'llab-quvvatlash, Huquqiy choralar, tibbiy xizmatlar.

Ключевые слова: Наркомания, Социальная поддержка, Правовые меры, медицинские услуги.

HYDRONYMS OF NAVOI REGION AND THEIR CLASSIFICATION

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Summary: *This article analyzes the principles of the formation of place names depending on the nature of the Navoi region. The natural geographical features of existing hydronyms in the region, their classification have been studied. Hydronyms are grouped according to their semantics.*

Key words: *hydronym, place names, principles of positivity, negativity, Zarafshan, well, spring, lake.*

Navoi region is considered one of the youngest regions of our republic and was established on April 20, 1982 for the purpose of development of Kyzylkum desert and intensive use of its natural resources. The main part of the land area consists of the desert area and occupies a large part of the Kyzylkum desert. The territory of the province is divided into 3 parts according to its natural conditions: the northwestern part is occupied by the Kyzylkum desert, where there are closed bogs (Karakota, Mulali, Mingbulok), sandy plains and residual mountains (Ovminzatog, Yetimtog, Bo Kantov, Tomditov, etc.); the southeastern part is occupied by low and medium-height branches of the Nurota mountain range (Koratog, Oktog, etc.) and depressions between the mountains (Nurota depression, etc.); In the middle of the Zarafshon river is the cotton growing zone of the region. In the Kyzylkum desert, along with the low and high plains, there are also closed depressions and in the central part, not very high residual mountains, which are the remains of the oldest land marks. Around the remnant mountains in the central part of the desert, there are many closed bogs, the largest of which is Mingbulok - 12 m below sea level [3:174].

The main water source of Navoi region is Zarafshan river. Konimex channel was released from Zarafshan. Kuyimozor and Todakul reservoirs are also important in providing water to the region. Navoi region, the largest region of Uzbekistan, occupies almost 1/4 of the territory of the republic. Water resources are insufficient due to the fact that most of the territory of the province consists of desert. Therefore, 2.2 mln. until now, the pastures are not used due to lack of water supply [1:174]. The largest hydrological object in the region's hydrography is the Zarafshan River, which belongs to the type of rivers fed by ice and snow. The river starts from the Zarafshan glacier, which is 2772.5 m above sea level at the junction of the Turkestan, Oloy, and Zarafshan ridges, and flows from east to west under the name of Mastchoh. This river gets the name Zarafshan after it joins the Fan river. River water is used in all branches of the national economy and mainly in agriculture, that is, it is used for irrigation of all gardens and fields of the valley.

If we explain the etymology of the name "Zarafshan", scientists pay attention to the word "zar" in the hydronym, and it is said that the river mainly brought sand and gold particles. The gold (zar) component of the hydronym is a symbol indicating that the object is related to a non-ferrous metal, sometimes the word gold can be used figuratively. That is why this river was named Zarafshan. In the literature of antiquity, including the monuments of the Avesta, Daitya - "Good water", in Arian's "History of the Campaigns of Alexander" the Zarafshan river is mentioned under the name Politimet. Translated from the Greek language, it means the name "Many famous river". In general, Zarafshan hydronym is mentioned in more than ten names in historical sources. In particular, it was interpreted by such names as Bukhara River, Jirt (10th century), John, Kohak, Namik, Rudi Mosaf, Haromkom, Obi Kohak, Sugd River [5:237]. The increasing demand for water in the upper part of the Zarafshon river is the reason for the decrease of river water reaching the territory of the region from year to year. The water of the Zarafshan river begins to decrease sharply from the territory of Navbahor district. The reduction of river water does not satisfy the water needs of the residents of Konimeh and Qiziltepa districts and the demand for the development of irrigated agriculture. Kuyimozor, Shorkol, Todakol reservoirs and Amu-Bukhara, Ortachol, Konimekh

canals were built in order to improve irrigated agriculture in these districts. Also, Lake Aydarkol is located in Nurota district of the region, and due to its salinity, it is not very important in agriculture. But small settlements around this lake use it for watering their livestock.

The names of any water bodies are called hydronyms (Greek "hydro" - water, "nom" - name). Ocean, sea, lake, river, stream, stream, well are names. The set of water names is hydronymy, and hydronymics is the science that studies hydronyms [6:318]. Hydronyms are distinguished from other types by the fact that they have been used in scientific literature for many years without change due to the antiquity and stability of the names of water bodies. Long survival of hydronyms, aspects of information transfer in them and their linguistic analysis provide rich materials and conclusions for researches in geography, local studies, history, ethnography, biology, archeology, zoology, geology and these fields. Therefore, hydronyms are considered the oldest place names in toponymy [2:120].

The naming of hydrological objects in the region is related to the location of the object and its relief, and it has relatively little weight in the toponymy of the region, because the northern and western parts of the region are desert areas. But there are many names of wells in the area. Among them, Shorchaquduq, Sharquduq, Doriquduq, Yantoqlikuduq - wells. Karmana district. In addition to these, we often find the names of springs and reservoirs in the hydronyms distributed in the territory of the region. Sorbulok, Karakatta - spring, Konimekh district; Salamandarqoq, To'dakol - reservoir, Kyziltepa district; Sho'rkol - lake, Uchkuduq district; Ashshibulok, Jing'ildi - spring, Uchkuduq district [4:623].

The naming of hydrological objects is based on the principles of positivity and negativity. The principle of positivity (Latin positivus - positive, positive) is the principle of naming hydrological objects based on understanding the natural geographical feature of the object or an event that gives the basis for naming. According to E.M. Murzayev, positivity is a reflection of geographical reality in these toponyms. Some examples of hydronyms created based on the principle of positivity are place names such as Chinor, Qamishli (Uchquduq district), Yantoqlikuduq (Karmana district), Qamishlibuloq (Uchquduq district), Aqoltin (Navbahor district). Around such hydro-objects, that is, ditches, streams, springs and canals, the orienting sign indicates that there are fields of maple, reeds, yantok and cotton. It can be seen that the name reflects a certain natural reality characteristic of the water body. This feature is clearly noticeable in all hydroobjects named on the basis of the principle of positivity [8:320].

The principle of positivity is the most common and widely used principle in naming water bodies. Names based on the principle of positivity occupy an important place in the hydronyms of Uzbekistan. For example, there are many such as Shorkul (Konimekh district), Kyzilquduq (Tomdi district), Shorkuduq, Uzunquduq (Karmana district), Karabulok, Saribulok (Tomdi district) named after the characteristics of a single water body. The existence of hydronyms is also a clear proof of our point [7:343].

In addition, the object is given a name based on the principle of relativity, in which the signs and characteristics of one water body are compared, compared and contrasted with another water body. Names based on the principle of relativity are often based on the characteristics of water (taste, size, color) instead of the location of the water body. For example, in the Navoi region, such hydronyms as Jilgiqoq-Siyozqoq, Qasburkit-Kumburkit, Katta kulon-Kichik kulon (Uchkuduq district), Kattazovur-Kichikzovur, Upper Bukhara-Lower Bukhara (Kyziltepa district) are among the names based on the principle of relativity.

Figure 1 below shows the grouping of water bodies studied during the research in our region and the number of hydronyms in these groups. According to him, hydronyms and anthropohydronyms, which are names representing the color, taste, and temperature of the object, made up the majority, and hydronyms and ethnohydronyms formed the least amount of names based on the time of construction of the object.

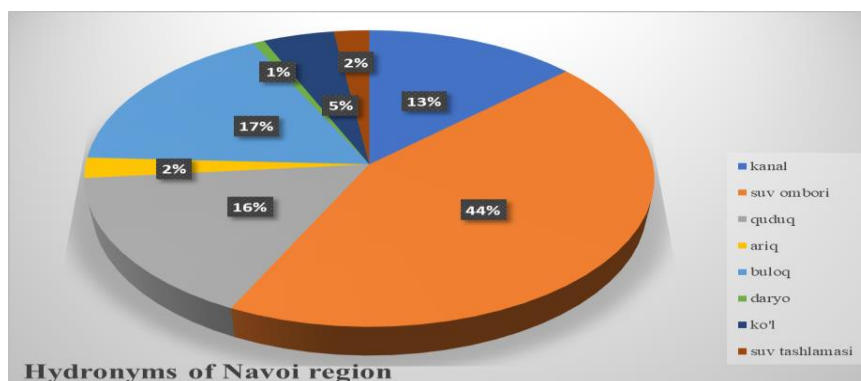


Figure 1. Hydronyms of Navoi region

According to the semantics, the hydrological objects of the Navoi region were divided into the following groups (Table 1):

- ❖ hydronyms related to ethnonyms (ethnohydronyms);
- ❖ hydronyms related to names of people (anthropohydronyms);
- ❖ hydronyms created according to the shape and structure of the size of the object (hydronyms according to size-shape-structure);
- ❖ hydronyms related to the names of oronymic objects;
- ❖ hydronyms related to animal and animal names (zoohydronym);
- ❖ hydronyms named according to the number of the object;
- ❖ agionymic and necronymic hydronyms;
- ❖ hydronyms named according to the location of the object;
- ❖ hydronyms based on taking into account the time of appearance of the water body;
- ❖ hydronyms representing a water body;
- ❖ hydronyms related to the names of plants;
- ❖ hydronyms named after the color, taste and temperature of water;
- ❖ hydronyms belonging to other species.

Table 1

Toponymic classification of hydronyms of Navoi region

Toponymic classification	Hydronyms
Names related to the place where the object is located	O'ng qirg'oq, O'rtacho'l, Dash-Nagorn, Quyimozor, Joyindibuloq, Markaziy kollektor, Yuqori Buxoro
Names generated based on the time the object was created	Old Karmana (Eski Karmana)
Orohydronyms	Ko'kboget, Qosburkit, Qumburkit, Tasqoq, Qumbog'ut, Jara, Jarliqop,
Names representing the type of water body	Shohrud, Shovot, Asovqoq, Jilg'iqoq, Siyozqoq, Sharquduq, Doriquduq, Jing'ildi,
Phytohydronyms	Oqoltin, Chinor, Kamisti, Qamishli, Yantoqliquduq, Qamishlibuloq
Zoohydronyms	Jilqishi, Qulonqoq, Bo'ritesken,
Names that express the size, shape, structure of the object	To'dako'l, Kichik qulon, Katta qulon, Uzunquduq, Murunquduq, Qorakatta, Kattazovur,
Names that express the number of an object	Beshrabot, To'rtquloq, Havza-5, Havza-4, Saksonboy, Oltiboy, Tortquduq,
Names that express the object's color, taste, and temperature	Qoramon, Qorabo'g'ot, Qizilqoq, Sho'rko'l, Qizilquduq, Zangor, Yomontaqir, Oqboget, Qorato'be, Qizilqoq, Qizilqum, Sho'rchaquduq, Sho'rquduq, Oqtosh, Sorbuloq, Sho'rbuloq, Qorabuloq, Saribuloq, Ashshibuloq, Qizilken, Sho'rko'l
Anthropohydronyms	Navoiy, Kudayberganqoq, Salamondarqoq, Malikobod, Isimboy, Parman, Asovboy, Shukirqoq, Berkimboy, Jumanazar, Qo'lbike, Mirzamo'min,

Ethnohydronyms	Do'rman, Chovli, Qarnab, Zormiton
Agionymic and necronymic hydronyms	Bobodo'g'i, Mozor, Qaraqata, Layliken, Duldul
Other species names	Kasaba, Amu-Buxoro, Taqsimlovchi-2, Shofirkon tarmog'i, Konimex, Qo'rali, Jengeldi, Shengeldi, Zarafshon, Yoshlik

The names of some hydrological objects located in the territory of the region indicate their geographical location, i.e., their location in the upper or lower part of the mountain, flowing past the settlements, the size and length of the object. In their composition, words expressing the above concepts are used. Here are some examples of such names: Right Bank, Joyindibulok (Konimekh district), Ortachol, Upper Bukhara, Kuyimozor (Kyziltepa district), Dash-Nagorn (Karmana district), Central collector (Navbahor district), available these hydronyms indicate the location of the object. Thus, hydronyms are sometimes named in relation to the appearance of an object, and through this name we can understand what it looks like. The names of such hydrological objects include hydronyms such as To'dako'l, Kattazovur (Kyziltepa district), Kichik kulon, Katta kulon (Uchquduq district), Uzunquduq (Karmana district), Murunquduq, Karakatta (Konimekh district).

In conclusion, as a result of our research on hydronyms in Navoi region, hydronyms that appeared according to the location of the object according to their semantics in the region, hydronyms that appeared according to their size, shape and structure, people's names hydronyms related to surnames, nicknames, hydronyms related to ethnonyms, hydronyms related to the names of oronymic objects, hydronyms related to flora and fauna, hydronyms named according to the quantity of the object, water hydronyms named in relation to color, taste and temperature are divided into groups such as hydronyms related to the time of appearance of a water body.

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Rezyume: Ushbu maqola Navoiy viloyati tabiati, tabiatiga bog'liq holda joy nomlarining shakllanish tamoyillari tahlil qilingan. Viloaytdagi mavjud gidronimlarining tabiiy geografik xususiyatlari, ularning tasniflanishi o'rganilgan. Gidronimlar semantikasiga ko'ra guruhlashtirilgan.

Резюме: В данной статье анализируется природа Навоийской области, принципы образования топонимов в зависимости от природы. Изучены природно-географические особенности существующих гидронимов в области, их классификация. Гидронимы сгруппированы по их семантике.

Kalit so'zlar: gidronim, joy nomlari, pozitivlik, negativlik tamoyillari, Zarafshon, quduq, buloq, ko'l.

Ключевые слова: гидроним, топонимы, принципы позитивности, негативности, Зарафшан, колодец, родник, озеро.

CONSTRUCTION OF HOUSING AND PUBLIC SERVICES IN THE CITIES AND REGIONS DURING 70-80S OF THE TWENTIETH CENTURY

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Summary: *The article examines and analyzes the progress of construction of housing works and public services in cities and rural settlements of Karakalpakstan on the basis of archival data and scientific works, and provides a critical analysis of the industry.*

Key words: *city, village, construction, housing, regulations, capital, government, farm.*

Everyone knows that housing begins with a house, and knows what a house is, as we all live in houses located along the streets that make up the city as a whole. However, a city, as a house and any creation of human hands, is far from being as simple as it seems: the city does not look the same throughout the history of mankind, it changes in material, social, and legal terms. In the conditions of Karakalpakstan, the construction and development of urban settlements in the twentieth century has a very interesting history, which is the subject of many monographs and essays by researchers. [1]

Following the chronological framework of the study, we can state that in the early 1960s the urban housing stock of the republic amounted to 250 thousand square meters, which would satisfy the needs of only 6 thousand urban residents; while in rural areas, the public housing stock was almost zero. [2.328]. According to eyewitnesses, even there were only a few 2-story houses in the city of Nukus: the building of the pedagogical institute and several government offices in the city center which was built in the 1930s, without sewerage or water lines. Only 30% of the city was covered by the water supply system. The solution to the housing problem was aggravated by the transfer of capital functions to Nukus, as a result of which about 30% of housing ends up being occupied by government institutions.

The state made efforts to reconstruct cities and towns; a number of legislative and regulatory acts were adopted on the planning and development of cities. On August 21, 1963, a resolution was adopted "Improvements on design work in the field of civil engineering, planning and urban development", on May 28, 1968 - "Measures on improving the quality of housing and civil construction", on September 12, 1968 - "Regularization on construction works in villages", February 3, 1970 - "Serious violations of state discipline in urban construction and housing." There was stated the thesis about "urban planning is a synthetic field of architectural and construction activity, covering both the issues of planning cities and settlements, creating their architectural and artistic appearance and related problems of settlement and regulation of urban growth, as well as issues of development itself" [3.15].

In the early 1960s, a technical and economic study for the construction of the city of Nukus was drawn up, on the basis of which a master plan for the city was drawn up. In 1965, it was approved by the Council of Ministers of Uzbekistan. According to the master plan, the city's territory is divided into zones: industrial-warehouse, sanitary-protective and residential.

A capital construction department was formed under the Council of Ministers of the Karakalpak Autonomous Soviet Socialist Republic. This department, together with individual ministries and departments, became the main developer of the city. Mass housing construction in the city began in the second half of the 60s. Housing construction was carried out according to standard designs throughout Karakalpakstan: residential buildings were made from local building materials, mostly one-story with a garden plot, sometimes two-story and three-story sectional houses. After the introducing the Nukus house-building plant in 1962, mass construction of 4-story residential multi-apartment large-panel buildings began in the city of Nukus and in other regional centers. By the way, we have to note that on August 12, 1965, the restriction on the number of floors of residential buildings built in cities and towns, adopted back in 1957, was abolished; in

which the issue of the number of floors of houses was transferred to local authorities for consideration. [4.58].

Local governments took a serious approach to the problems of urban and human settlement growth. It was predicted that by 1980 the urban population of Nukus would be 150 thousand people, and in the future 350 thousand or more. Therefore, the task was set to accelerate housing construction, systematic reorganization of villages, taking into account social and everyday transformations not only in cities, but also in villages; for which 36.5 million rubles were spent annually. The long-term period for the construction and development of cities and towns was determined to be 25-30 years, and for rural settlements - 15-20 years in accordance with organizational and economic plans.

In the 1950-1960s, master plans and schemes were developed for a number of cities and regional centers of Karakalpakstan, such as Muynak, Khojeyli, Kungrad, Beruni, Mangit, Khalkabad, Kegeyli, Chimbay, Takhtakupyr. However, practical implementation in these centers depended on the level of development of industry and agricultural production. In the early 50s, as a result of the construction of the Chardzhou-Kungrad railway, the cities like Khojeyli, Kungrad, and Takhiatash had improvements. [5.45]. Consequently, new industries have appeared in these cities, such as mechanical repair and woodworking plants in Takhiatash; and the main transshipment and supply organizations are concentrated in Kungrad and Khojeyli. [6.27]

In the 1960s, due to a sharp increase in the volume of industrial, agricultural, housing and cultural construction in the republic, the base of the construction industry started to develop in Nukus. Four large industrial enterprises and 17 workshops, a house-building plant and a building materials plant were put into operation during 1959-1965 [7], although by the mid-1970s the capacity of these enterprises did not meet the requirements of the pace of housing construction in the republic. The capacity of the Nukus house-building plant was 35 thousand square meters per year, whereas the building materials plant - 30-40 thousand cubic meters. [8.44]. To fully meet the needs of the population of the republic, it was necessary to reconstruct the capacity of the DSK, increasing it by 75-100 thousand square meters. m per year, and KSM up to 1000 thousand cubic meters, as well as the construction of 2-3 new DSKs, factories of reinforced concrete structures and other construction enterprises. It should be noted here that in that system of power structure this required the consent of the central apparatus in Moscow. According to K. Kamalov, in the 1970s, after the efforts of the republic's authorities, the center's consent was received to increase the capacity of the Nukus DSK to 75 square meters of housing per year. [9.247].

Great importance for regulating the growth and development of cities was the justification for the choice of area and point for the construction of new enterprises, expansion and reconstruction of existing enterprises. By 1970, 26 industrial enterprises operated in the city of Nukus alone; in the following years, the volume of capital investments in the development of the municipal economy reached up to 170 million rubles, as a result, during the same period 140 thousand square meters were put into operation of living space. In the republic only in 1971, 131 thousand square meters were put into operation of housing, schools for 3,100 student places, hospitals for 1,101 places, kindergartens for 990 places, etc. [10.4]

The complexity of the problems of meeting the housing needs of the population of Karakalpakstan led to the need to draw up a master plan for the construction of cities and towns in the republic, according to which standard micro-districts began to be built. In the 1970-1980s in the city of Nukus alone, the construction of 21 micro-districts was completed, the construction of new residential micro-districts 22, 23, 24, 25 and 26 began, in parallel with new schools, kindergartens, and public utility institutions. However, the provision of housing for the urban population in Uzbekistan was still low. In 1975, the housing stock of the republic amounted to 48,846.0 thousand square meters per 5483.8 thousand urban residents, which is an average of 8.9 square meters per person. Meters. And, in 1978 the housing stock of Uzbekistan amounted to 56,933 thousand square meters for 6340.2 thousand inhabitants and, on average, for each – 8.98 square meters [11.27].

In connection with the adoption of the resolution of the Central Committee of the Communist Party of Uzbekistan and the Council of Ministers of the Uzbek SSR "On the liquidation of the farm system and radical improvement of capital construction on collective farms of the republic," in September 1974, the republican leadership identified specific tasks for the liquidation of farms. Republican and district commissions were formed to implement measures related to the liquidation of farmsteads. By 1980, the number of villages was supposed to be reduced to 1,300, and the construction of new villages was planned. Much attention was paid to urban agglomeration. The city of Nukus united several suburban industrial zones, among them the village of Pristansky, a brick factory with a group of industrial enterprises under construction. Even the architect K. Molotov assumed that these villages "have a tendency to gradually merge in the future with the city of Nukus." [12.30]. In the city of Nukus itself in 1974-1975, 3 thousand families moved into new houses. [13.48]. New 5-story, 40-apartment brick residential buildings have appeared on A. Dosnazarova Street, in the 22nd micro-district. It was planned to build several more similar residential buildings.

In general, 7,694 thousand rubles were spent on housing construction in 1971-1980 in Uzbekistan, as a result of which 866 million square meters of housing or 4 thousand apartments were commissioned, including 619 million rubles of capital investments in Karakalpakstan, 1468 thousand square meters of housing commissioned [14.218].

At the turn of the 1970s-1980s, there were few cities and urban-type settlements in Karakalpakstan, mainly rural settlements prevailed. These settlements had very diverse shades in their development and in terms of housing and communal services. The capital of the republic, the city of Nukus, was a small city, mainly with two and three-story residential buildings. According to the 1979 census, Nukus was part of 276 large cities in the country with a population of over 100 thousand people. [15.3]. By the way, according to the standards of differentiation and determination of the status of cities, groups of largest cities (with a population of more than 500 thousand people), large (from 250 to 500 thousand people), big (from 100 to 250 thousand people), medium (from 50 to 500 thousand people), small (up to 50 thousand people), settlements (industrial and resort), rural settlements. [16]. Nukus gained the status of a large city due to the growth of production capacity of the republic's construction industry. Compared to 1975, in 1980 the disbursed funds invested in housing construction by state and cooperative organizations increased by 113.3%, the volume of capital investments by 125.1%. [17.26]

Thus, by the mid-1970s, the total volume of housing stock in Karakalpakstan amounted to 2163 thousand square meters.[18.40] Increased requirements for housing construction of urban and settlement types have necessitated the search for new solutions. In 1975, the Department of Construction and Architecture of the Government of the Republic announced a competition to develop design proposals for one-story and single-apartment residential buildings for state, collective farm, cooperative and individual construction in villages and regions. Based on the results of the competition, the State Construction Committee of Uzbekistan entrusted the "Uzgi-proselstroy" Institute with the development of a series of projects that best meet the conditions of Karakalpakstan.

Not far from the city of Nukus, the cities of Takhiatash and Khojeyli were formed, which were determined, first of all, by the emergence of large industrial enterprises - the Takhiatash State District Power Plant and others. Localization of industrial enterprises in the Republic of Karakalpakstan for 1960-1975 has not undergone fundamental changes.

No less pressing was the issue of the quality of housing being commissioned. In August 1974, the State Construction Committee of Uzbekistan excluded 12 residential and 13 civil facilities from the commissioned list. At the same time, in Karakalpakstan the housing commissioning plan was completed by only 85%. [19.98]

However, in the conditions of Karakalpakstan, the dispersal of financial and material labor resources continued, their diversion for unscheduled construction of administrative and other structures, untimely provision of design and estimate documentation, financing, interruptions in

material and technical supplies, and poor labor organization. Every year the plans of both construction organizations and production associations were thwarted. For instance, in 1975, the plant for the construction of large-panel houses did not fulfill its plans; reserves at brick factories and factories for reinforced concrete structures were not fully used. [20.46]. With a production capacity of 83.6 thousand cubic meters per year in 1975, 51.9 thousand cubic meters of reinforced concrete structures were produced, bricks of 120 million pieces per year – respectively, 82.1 million pieces. There was still little use of local building materials - marble, granite, marble chips, ceramic slabs. The Nukus Granite and Marble Plant, commissioned in 1973, was just gaining its capacity.

In the republic in 1976-1980, state and cooperative organizations and enterprises invested 4207 million rubles of fixed assets, 4668 million rubles of capital investments into large-scale construction, and carried out construction and installation work worth 3199 million rubles. [21.49].

Particular attention was paid to the construction of rice-growing state farms, centralized settlements, and housing on newly developed lands. According to government decisions, the task was to transform rural settlements into urban-type settlements with comfortable residential buildings, public services, household enterprises, cultural and medical institutions, as well as the necessary engineering equipment and landscaping. In populated areas, it was necessary to comprehensively solve socio-economic, architectural, construction, sanitary, hygienic and engineering problems, taking into account the order of construction of a populated area and its development in the future.

As a result, in 1961-1980, 4921 thousand square meters of housing were built throughout the republic in total, for 1975-1980. – 2164 thousand sq. m., that is, on average, 432 sq. m. of housing per year. More than 65% of housing was built using loans and individual funds from the population itself [22.50].

Thus, at the turn of the 70-80s, housing and communal construction in the republic took place due to large government investments, however, serious shortcomings and deterioration in the capabilities of the construction industry revealed the need for serious reforms in this industry. There was a situation where there was an over expenditure of capital investments, and the amount of work performed did not correspond to what was planned. Individual housing construction took place only with a certain effort from the developers themselves, and the assistance of government agencies was minimal. The population of the republic increased, but the problems of their housing remained unresolved. From the above we conclude:

- The history of the actual development of housing and communal construction in Karakalpakstan begins in the mid-1950s, when there was an urgent need to solve the problems of localizing the population in certain places of residence and work.

- The state of the national economy of the republic in the 1950-1960s caused an increase in internal migration of the population; in addition, the state, given the importance of the housing problem as a weapon of coercion, began to focus on providing public housing to the population and stimulating individual housing construction. Naturally, due to economic opportunities, the state could not fully provide them with building materials. However, it held a state monopoly on land and resources.

- In the conditions of Karakalpakstan in the 1960-1970s, the solution to the housing problem depended on personnel and production capacity, so the first steps of the government of the republic were to create a regulatory, material and technical base for the construction industry and provide it with highly qualified specialists. This circumstance soon made it possible to increase production capacity and speed up the solution to the housing and communal problems; however, housing construction lagged far behind the demographic growth of the population.

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Rezyume: *Maqolada Qoraqalpog‘istonning shahar va qishloq aholi punktlarida uy-joy qurilishi va kommunal xizmatlar ko‘rsatishning borishi arxiv ma’lumotlari va ilmiy ishlar asosida o‘rganilib, tahlil qilinib, soha faoliyati tanqidiy tahlil qilingan.*

Резюме: *В статье рассматривается и анализируется ход строительства жилищных работ и коммунальных услуг в городах и сельских населенных пунктах Каракалпакстана на основе архивных данных и научных работ, дается критический анализ отрасли.*

Kalit so'zlar: *shahar, qishloq, qurilish, uy-joy, nizom, poytaxt, hukumat, fermer xo'jaligi.*

Ключевые слова: *город, село, строительство, жилище, постановления, столица, власть, хутор.*

EDUCATE YOUNG PEOPLE IN THE MOTTO OF PATRIOTISM IS OUR MAIN DUTY

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Summary: *This article analyzes the specific features of educating young people in the spirit of patriotism.*

Keywords: *Homeland, State development, home, patriotism.*

It is very important to educate young people in the spirit of patriotism. It is a supportive environment that encourages them to cherish their country with love and respect, learn civic duties, respect their national values, and be useful to their country. It is important for young people to learn about national identity, rights and advice, and the historical, cultural and economic characteristics of their homeland. As a result, they become good citizens of their country and contribute to its development. This will increase the spirit of patriotism, strengthen the country and prepare effective citizens in the future. Naturally, we will talk about what methods are used to educate young people in the spirit of patriotism? New methods, educational models, youth-interesting campaigns, community activities that youth can participate in, etc. How will it be shown to you?

There are several approaches to promoting patriotism.

1. Educational Models: Integrate topics related to national history, culture, and legal concepts in textbooks, lessons, and additional educational materials.
2. Creative Activities: Organization of creative activities, such as painting, poetry, writing, etc., to increase the spirit of patriotism among the youth.
3. Community Activities: Organize community activities in which youth can participate to demonstrate patriotism, such as participation in national holidays, creative forums, tours of historical sites and institutions.
4. Internet Platforms: Creating online resources and platforms to promote the spirit of patriotism. In this, you can get information about the history, culture, natural scenery, civic duties of your homeland.
5. Government Programs and Latest News: Through government programs and social news, the youth are given their contribution in the development of the country and ensure their participation.

These are just a few examples. Methods aimed at increasing the spirit of patriotism should be followed, because there are characteristics of each country, society and category of youth. First of all, it is necessary to update textbooks and teaching materials in order to integrate topics related to national history, culture and patriotism in a wider way in the educational process. Students develop flexible and engaging textbooks and instruction to enhance their knowledge of their country's history, literature, and national values. The second is the organization of scientific and creative events. These activities open the way to teach the history, culture, national music, literature, and art of their countries. Such events create opportunities for creative and interactive participation for young people. The third is the organization of community activities. Such activities include national holidays, songs, literary pastimes, and sporting events. Through these events, young people learn national values and feel part of the community.

The fourth includes internet platforms and mobile applications. These platforms and applications provide students, their parents, and teachers with opportunities to learn about national history, culture, and literature. These are just a few of the methods that are expected. In educating young people in the spirit of patriotism, not only one way should be established, but a number of transitions should be introduced. We write other approaches. To educate young people in the spirit of patriotism:

1. Independent Speaking Lessons: Create fun and interactive lessons, including encouraging students to express themselves, reason and debate. In this way, they learn the terms of their country.

2. Preparing Youth for Civic Duties: Creating opportunities for youth to participate in community activities and projects. This will be necessary for how they integrate into their country, solve social problems, and internalize their national values.

3. National Holidays and Events: To strengthen the national identity of the youth by educating them about national holidays, events and values. These events can be held at historical sites, museums or theaters of their countries.

4. Videos and Virtual Tours: Organization of virtual tours, videos about historical places and institutions through Internet platforms. Through this method, young people learn about national historical, cultural and natural places.

5. National Films and Animations: Teaching the youth about national values through national films, animations and programs. This type of multimedia material makes learning interesting and thoughtful.

These methods are important in educating young people in the spirit of patriotism. Each method has its own advantages and helps to strengthen the national spirit of the youth.

Another way is to invite young people to participate in online platforms related to national and community values. Social networks, forums, and online communities allow students to communicate, exchange ideas, and express their ideas about national values, historical events, and current issues. This method requires continuous online education and allows students to connect with other young people around the world, thinking about the museums, sights, and cultures of their countries. These features strengthen the youth's interaction with the global society and help to increase their patriotism. In order to educate young people in the spirit of patriotism in a country, various games and familiarizations related to national identity can be organized. Through these games, young people learn about national values, historical events, and cultural heritage. For example, with the help of interactive historical games, they can learn about the history of their country. To increase this, it will be useful to organize acquaintances and competitions, including acquaintances and competitions in national literature, music, cuisine, and sports. This kind of acquaintances and competitions are necessary for young people to appreciate their national values, cultural heritage and help to educate them in the spirit of patriotism.

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Rezyume: *Ushbu maqolada yoshlarni vatanparvarlik ruhida tarbiyalashning o'ziga xos xususiyatlari tahlil qilingan.*

Резюме: *В данной статье анализируются особенности воспитания молодежи в духе патриотизма.*

Kalit so'zlar: *Vatan, davlat taraqqiyoti, uy, vatanparvarlik.*

Ключевые слова: *Родина, Государственное развитие, дом, патриотизм.*

CHANGES AND DEVELOPMENTS IN THE HISTORY OF BOZATOV DISTRICT

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Summary: *This article provides extensive information about the creation and reasons for the abolition of the Bozatau district. It discusses the role and significance of the Bozatau district in the socio-political life of the Republic of Karakalpakstan. The paper also presents information on the achievements and results in the socio-political and economic spheres of the district. Additionally, it addresses the recent work carried out as a result of transforming the Bozatau district into a specialized zone.*

Key words: *socio-political life, district, economy, livestock, territory, innovation, specialized district.*

After the Republic of Uzbekistan gained independence, it was achieved constitutionally and peacefully. The administrative-territorial structure, like all institutions of state bodies, has its own constitutional guarantees. The administrative-territorial structure of the republic consists of 16 districts and 1 city: Amudarya, Beruni, Bozatau, Ellikkala, Turtkul, Kegeyli, Chimbay, Karaozak, Takhtakopir, Kanlikul, Shumanoy, Kungrad, Moynak, Khojayli, Takhiatash, Nukus districts [1. 14].

As the President of the Republic of Uzbekistan Shavkat Mirziyoyev said: “Working tirelessly for the development of their homeland, motherland - this is generosity, love and devotion to the motherland, it is a proper upbringing and a practical example” [2.1].

In 1979, Bozatau district of the Republic of Karakalpakstan established livestock farms “Turtkul” of Turtkul district, “Kazanketken” of Beruni district, “Porlitaw” of Amudarya district, “Karakalpak” of Chimbay district, “Kazakh-darya” of Moynak district and “Aspantay” of Khojayli district. These farms specialize mainly in animal husbandry and graze large horned cattle on pastures [3.]. The total land area of the district is 2850 sq. km, with a population of 17,7 thousand people, the center of which is the settlement “Kazanketken” [4.3].

Bozatau district of the Republic of Karakalpakstan was abolished in accordance with the Decree of the Presidium of the Supreme Soviet of the Uzbek SSR of September 2, 1988 “On amendments to the administrative-territorial division of the Uzbek SSR” [5.275].

However, the decision of the former Central Committee of the USSR and the Council of Ministers of the USSR №1110 of September 19, 1989, given the large area of land for the development of livestock and fodder production [6.4], recognized the need to create an administrative-territorial independent district. the district was rebuilt in March 1990. The main task in the reorganization of Bozatau district was to improve the management of economic and socio-cultural construction, specialization of agriculture, the rapid solution of the food program and the daily needs of the population [7.1].

The composition and income of the population in the district at that time was 20,5 thousand people, of which 12,4 thousand people or 61,6% were Karakalpaks, 7,5 thousand people or 35,3% were Kazakhs. The labor force was 8,440 people, of which 6,500 were employed in the national economy, and more than a thousand people were in need of employment. The average salary is 21,5 thousand soums a month, including 12,1 thousand soums in agriculture, 31,3 thousand soums in construction, 29,8 thousand soums in communications and 25,8 thousand soums in government agencies. The average salary was 9,1 thousand soums less than the national average. Deposits of the population in the People’s Bank in 2003 amounted to 9,2 million soums, and in 2004 – 4,9 million soums, with an average of 5,2 thousand soums per depositor.

When studying the level of satisfaction of the population's demand for agricultural products in the district, in 2002 the consumer demand for 1366 tons of vegetables and melons (or 66.3% of demand), 1397 tons of wheat (72.9%), 616 tons of meat and meat products (42, 2%), 598 tons of potatoes (96.4%), 973 tons of milk and dairy products (50.7%).

According to the analysis of socio-economic indicators of Bozatau district for 1990-2003, not a single large industrial enterprise has been established. There are 2 non-governmental industrial enterprises in the district, which in 2003 produced goods worth 109,2 million soums, whose activities involved the processing of meat and meat products. In 2003, a Chechen joint venture was opened in the district in cooperation with the South Korean government, which collected lacquer veins and exported products worth \$21,4 thousand. Unfortunately, the enterprise was not able to operate on a large scale [8.18].

Bozatau district specializes in the production of livestock products, until 2003 there were 7 company farms and 73 (91 in 1990) farms. The total area under crops in the district was 14,115 in 1990, 3,969 in 2003, and the area under crops has decreased by 3,5 times in the past period.

The total number of cattle in the district decreased from 36,738 heads to 22,882 heads, including 16,009 heads on company farms, or a decrease of 1,6 times. At the same time, the number of cows fell from 9,266 to 6,759, while on company farms it was 3,864. Meat production, the district's main livestock product, was 1,135 tons in 1990, while in 2003, companies and farms together produced 476 tons of meat, a 2,4-fold decrease. In 1990, vegetable crops were planted on 86 hectares of land, yielding 577 tons, with a yield of 67,1 quintals. In 2003, 243 tons of crops were planted on 92 hectares of land and the yield was 26,4 quintals.

Melons were grown at 2,918 tons in 1990, down from 164 tons in 2003. Cotton was planted on 540 hectares of land in 1990 and yielded 603 tons, while in 2003 the cotton crop was not planted at all.

According to the Resolution of the Cabinet of Ministers of the Republic of Uzbekistan dated August 1, 2002 No 276 "On further development of agricultural production in the Republic of Karakalpakstan in 2003-2007" in 2003 the number of cattle in Bozatau district increased to 24400 heads. With this decision, 300 hectares of land will be planted with sunflowers, and 180 hectares will be planted with sunflowers, yielding only 2,1 quintals. Cereal corn was planned to be planted on 2,000 hectares, but was actually planted on 122 hectares and yielded 121 tons or 9,9 quintals per hectare. If we look at the state of agricultural machinery, in 1990 the district had 606 different tractors, while in 2001 their number was 203. The same situation continued with tractor trailers, falling from 356 to 76. Combine harvesters were down from 37 to 13.

When analyzing the financial performance of 7 companies in Bozatau district, it was observed that every year the economic activity ends with a profit. However, the total accounts payable of these farms averaged 9 times the amount of receivables and continued to grow each year. As of January 1, 2002, accounts payable amounted to 255,7 million soums, in 2003 – 557,5 million soums, in 2004 – 612,9 million soums.

Expenditures of the local budget of the district in 1990 amounted to 2783,2 thousand rubles, of which 87,8% were covered by subsidies. In 2004, budget expenditures were planned at 1,1 million soums, of which 886,2 million soums or 86,4% were covered by subsidies.

The number of registered taxpayers in the district is 235, of which 147 or 62.5% are active. In 2003, 76,9% or 95,4 million soums of tax revenues totaling 124,0 million soums were tax on personal income, property and land taxes, while 15,2% or 18,9 million soums were tax on corporate income formed from property, value added tax, and land tax. All other types of taxes amounted to 7,8 percent or 9,6 million soums, including income tax for individuals and legal entities engaged in entrepreneurial activity – 2,4 million soums, farmers' market fees – 0,5 million soums. All other types of taxes amounted to 7,8 percent or 9,6 million soums, including income tax for individuals and legal entities engaged in entrepreneurial activity – 2,4 million soums, farmers' market fees – 0,5 million soums [8.18].

As of January 1, 2004, there are debts of 4.4 million soums. However, according to the protocol of the Government Commission No. 4 of January 14, 2004 "On improving the mechanism of settlements and strengthening the discipline of payments to the budget", 7 million soums, a total of 68.4 million soums of taxes and pensions were extended.

In 1990, there were 8 preschool institutions in Bozatau district, compared to 8 in 2004. In 1990, the district had 137.9 hospital beds per 1,0 people, while in 2004 it had 55 beds. The building of the district central hospital is in need of major repairs, as well as the replacement of existing medical equipment and facilities. The hospital does not have a system of sewerage, sewage disposal and treatment.

The average per capita production of consumer goods in the country amounted to 27,5 thousand soums, in Bozatau – 4,1 thousand soums, or 6,7 times less, and the volume of retail trade – 22,7 thousand soums, which is 4 times less. At 90,4% of the country's population, natural gas supply was 69% in Bozatau district (97% in Chimbay district and 87% in Kegeyli district). Drinking water supply in the country is 70,1%, and in Buzatov district – 61,7%, an increase of 2% over the past 5 years. Neither the district administration nor the republic has taken sufficient measures to restore the pre-drought indicators of agricultural production in the district in recent years.

Based on the above, it should be noted that the district administration at that time had very little opportunity to improve the living conditions and develop the economy. Even with the liquidation of the district, taking drastic measures to develop the former companies and settlements of the district, 1.0-1.5 thousand new jobs were created on the basis of preferential financial assistance, which provided employment and income to the population. The hokimiyats of Chimbay and Kegeyli districts, the leadership of the republic had to prioritize the socio-economic development of the companies located in the territory of the former Bozatau district and take urgent measures.

Taking into account the results of field meetings and the wishes of the population, on January 31, 2004 a special session of the Bozatau District Council of People's Deputies considered and approved the decision of the Presidium of the Supreme Council (Jo'qargi Kenes) of the Republic of Karakalpakstan on November 22, 2002 №399.

Thus, by the decision of the Supreme Council (Jo'qargi Kenes) of the Republic of Karakalpakstan №561 of February 26, 2004 "On the dissolution of the Bozatau district of the Republic of Karakalpakstan" Bozatau district was liquidated [9.1].

Fifteen years later, the issue of reorganization in Bozatau district of the Republic of Karakalpakstan was considered. Appeals of "Bozatau" village assembly of Kegeyli district of the Republic of Karakalpakstan, "Erkindarya", "Quskanataw", "Aspantay" aul citizens' assemblies and "Kok-suv" aul citizens' assembly of Chimbay district, resolutions of Kegeyli and Chimbay district Kengashes of People's Deputies of the Republic of Karakalpakstan Taking into account the proposal of the Council to unite the territories of the relevant citizens' assemblies and establish Bozatau district, Article 67 of the Constitution of the Republic of Karakalpakstan, Article 1 of the Law of the Republic of Karakalpakstan "On the procedure for resolving issues of administrative-territorial structure in the Republic of Karakalpakstan" In accordance with Article 7 of the Law of the Republic of Karakalpakstan and Article 49 of the Law of the Republic of Karakalpakstan "On the Rules of Procedure of the Supreme Council (Jo'qargi Kenes) of the Republic of Karakalpakstan" Bozatau district was established on the basis of the decisions of the Senate of the Oliy Majlis №711-III and August 30, 2019 №QQ-585-III "On the establishment of Bozatau district in the Republic of Karakalpakstan" [10.2].

In Bozatau district of the Republic of Karakalpakstan, employment, income and living standards of the population, especially women, youth and low-income citizens, through the implementation of promising projects for the rational use of production and labor potential, development of industry, agriculture, services and family business. Resolution of the Cabinet of Ministers of the Republic of Uzbekistan dated April 18, 2020 №243 "On measures for integrated socio-economic development of Bozatau district of the Republic of Karakalpakstan in 2020-2021" The decision was made. This decision created opportunities for the establishment of agricultural, veterinary and livestock, fishing clusters. At present, this work is being carried out in sequence.

In particular, the territories of “Bozatau” village assembly of Kegeyli district, “Quskanataw”, “Erkindarya”, “Aspantay” aul citizens assemblies and “Kok-suv” aul citizens assembly of Chimbay district were merged with a total area of 2035.44 sq.m. km. was transferred to the territory of Bozatau district of the Republic of Karakalpakstan, and the administrative center of Bozatau district was designated the citizens' assembly “Bozatau” [11.1].

A critical study of the state of industry, services and other sectors of the economy in Bozatau district, the development of the Program of socio-economic development and improvement of living conditions of the population in Bozatau district for 2019-2021 and the amount of required funds and its sources developed.

Also, deputies of Kegeyli and Chimbay district Councils (Kengashes) – people’s deputies elected from the constituencies of “Buzatov” village, Kegeyli district, “Quskanataw”, “Erkindarya”, “Aspantay” and “Kok-Suv” aul of Chimbay district. People’s Deputies are deputies of the Bozatau District Council.

Thus, the resolution of the Supreme Council (Jo‘qargi Kenes) of the Republic of Karakalpakstan №561 of February 26, 2004 “On the abolition of the Bozatau district of the Republic of Karakalpakstan” became invalid.

As the head of our state noted at a meeting with young people at the Muhammad al-Khwarizmi School of Information Technology on December 27, 2019, we will definitely build a new Uzbekistan together with young people. 2020 will be a turning point in state youth policy. At the initiative of President of the Republic of Uzbekistan Shavkat Mirziyoyev, the reorganization of the Bozatau district, which specializes in animal husbandry, has brought joy to the population, especially the youth. Today, as in all regions of the Aral Sea region, a number of positive changes are taking place in this district. The establishment of the Bozatau District Council of the Youth Union of Uzbekistan in May 2020 was one of the most memorable events in the lives of young people.

Today, large-scale construction and creative work is being carried out in the district center. In particular, the establishment of Boz-Tex Limited Liability Company has provided employment for many young people. The company has a production capacity of 1.5 million units a year, or 2 billion 250 million soums, and currently employs 90 women. Three employees of “Jayxun Baraka Chevarlari” Limited Liability Company in Ellikkala district are mentoring young people. According to experts, the company’s products, equipped with the most modern equipment, are of great interest not only in the domestic market, but also abroad. Today, export contracts have been signed with a number of cities of the Russian Federation.

A “Youth Park” was established on the territory of the “Bozatau” township on a 5-point plot of land. 5,000 fruit trees and melons have been planted here. 30 young people from the group “Fidoyi Yoshlar” were provided with jobs. In addition, 300 greenhouses were built in the district, 30 of which were given to unemployed youth. One of them, U.Jumanazarova’s greenhouse, currently grows more than 100 kilograms of tomatoes and sells them to the population at low prices.

Limited Liability Company “Moynak Kelajak Bunyodkorlari”, established by the relevant resolution of the Cabinet of Ministers of the Republic of Uzbekistan, has been allocated 500 square meters of land. In 2020, 40 young people were employed in 168 indicators. Of these, 118 were planted with corn and 50 with alfalfa. Work in this regard is ongoing.

A youth center, an 800 seat amphitheater and a modern 1,0-seat football stadium have been commissioned in Bozatau district. English, computer technology and dance clubs were organized at the youth center. Today, along with the large-scale work on employment and social support of youth in Bozatau district, future plans have been identified. In particular, “Bunyodkor Yoshlar” detachments have been established, preferential loans have been allocated to young people within the framework of the State Program “Every Family is an Entrepreneur”, and the issues of popularizing the experience of Moynak youth in establishing greenhouses have been positively addressed [12.1].

In short, the Republic of Karakalpakstan Bozatau district has been removed from the list of backward districts, and the Republic of Uzbekistan is becoming a comprehensively developed region, which contributes to the economy of the republic. Proposals and recommendations for the socio-political and economic development of the Bozatau district were developed, and specific and targeted directions were adopted. The comprehensive development of this district plays a significant role not only in the life of Karakalpakstan, but also in the socio-political and economic development of the Republic of Uzbekistan. Currently, the district specializes in animal husbandry and meets the country's need for meat and meat products. Also, the festivals held in the Bozatau district serve to showcase the potential of the youth of our country.

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Rezyume: *Maqolada Bo‘zatov tumanining tuzilishi va tugatilish sabablari haqida keng ma’lumotlar berilgan. Qoraqalpog‘iston Respublikasining ijtimoiy-siyosiy hayotida Bo‘zatov tumanining tutgan o‘rni va ahamiyati kasb etiladi. Shuningdek, tumanda ijtimoiy-siyosiy, iqtisodiy sohalarda erishilgan yutuqlar va natijalar bo‘yicha axborotlar keltirilgan. Keyingi paytlarda Bo‘zatov tumanining ixtisoslashtirilgan hududga aylantirilishi natijasida amalga oshirilgan ishlar bo‘yicha ham so‘z etiladi.*

Резюме: *В статье приводится обширная информация о создании и причинах упразднения Бозатауского района. Роль и значение Бозатауского района в общественно-политической жизни Республики Каракалпакстан. Также представлена сведения о достижениях и результатах в социально-политической и экономической сферах района. Речь также идет о работе, проделанной в последнее время в результате преобразования Бозатауского района в специализированную зону.*

Kalit so‘zlar: *ijtimoiy-siyosiy hayoti, tuman, iqtisodiyot, mol chorvachilik, hudud, yangilik, ixtisoslashtirilgan tuman.*

Ключевые слова: *общественно-политическая жизнь, район, экономика, скотоводство, территория, инновации, специализированный район.*

DESCRIPTION OF THE POWERS OF LOCAL COUNCILS

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Summary: *In this scientific article, the competences of local councils are classified and analyzed in detail based on the opinions of scientists and experts who have conducted research within this topic.*

Key words: *Council, authority, function, competence, representation, local, state, activity.*

Within the framework of ensuring the implementation of legislative acts in the implementation of the tasks of socio-economic development, communication between the state authorities and governing bodies and the self-governing bodies of citizens, the involvement of the population in the management of the city, district, local councils carry out the relevant powers along with the governors. The two branches of local state government (executive and Representative), together with their continuous interaction, carry out the tasks assigned to them using various methods and methods. Issues related to the performance activities of local state authorities are discussed at the session of local councils of people's deputies [1].

The directions of the activities of local councils and the institutional foundations of their powers have been analyzed in various ways by researchers and scientists.

J.Ermashev noted that the task of representative bodies in the field of socio-economic and cultural development is to determine, coordinate and control the general direction, and the task of executive management bodies is to direct them using their structural units [2].

In our opinion, we can partially agree with J.Ermashev's opinion about the role of representative bodies in the field of economic, social and cultural development of regions. According to the legislation, the tasks of local representative bodies are to ensure the implementation of social and economic development tasks that are common in the region, to ensure the implementation of legislative documents in the localities, to ensure the communication between the state authorities and self-government bodies of citizens, to involve the population in the management of the district and city.

According to A.Tolaganov, the functions of representative bodies of state power mean their socio-historical support, the main aspects of the activities aimed at the implementation of state power belonging to the people [3].

Also, A.Tolaganov stated that representative bodies of state power use the following tools in the implementation of their functions: adoption of regulatory legal documents in accordance with the Constitution of the Republic of Uzbekistan. Giving orders is a directing and coordinating activity. Councils of People's Deputies form bodies subordinate to them, direct the activities of enterprises, organizations and institutions located in their territories and subordinate to them, coordinate the activities of enterprises, organizations and institutions located in their territories but subordinate to the higher councils. Local Councils supervise the activities of the bodies reporting to them. Also, the Councils of People's Deputies supervise the provision of legality, law and order and security in their territories. Theodore Metaxas emphasized that the role of local authorities in the state system and its main features, their powers and jurisdiction, as well as the autonomy of management at the central local level are considered [4].

A.Makhmudov said that local representative bodies should carry out control activities: firstly, to determine the factors and conditions affecting the effectiveness of the law; secondly, to achieve the implementation of each legal norm; thirdly, to identify legal norms, shortcomings in their application and to develop proposals for their elimination; fourthly, it provides for the high responsibility of officials in law enforcement and legal culture of citizens [5].

Legal scholars M.Najimov and M.The utemuratovs classified the powers of local councils and divided them into two types. The first is "the absolute powers of the councils of people's deputies, which are decided only on the side of the councils. The second type includes other powers, that is, they can be performed by governors at the time between sessions, but it must necessarily be approved in the session of the issue [6].

At the beginning of the analysis of the powers of the representative bodies of local state authorities, that is, local councils, it is advisable to dwell on the content of the concept of "authority". Explanatory dictionaries define the concept of "authority" ("vakolat" from Arabic – representation; entitlement) – that is, the right given to act on behalf of a person, institution, organization, state, right of representation [7].

Researchers and scientists connect the concept of authority with competence and analyze it as a set of rights and obligations, as well as tasks and functions, belonging to a specific subject.

Competence is defined as a set of tasks, functions, rights and obligations (authorities) of state bodies, officials, public organizations, commercial and non-commercial organizations defined in regulatory legal documents [8].

At the same time, within the concept of "authority" in relevant sources, it is appropriate to understand not only the rights of subjects, but also the set of rights and obligations granted by legislation. Powers are the rights and obligations of a state body, a local government body, an official, other participants in public relations defined in the regulatory legal document [9].

It is appropriate to include rights and obligations within the concept of authority, and corresponding duties and functions in the concept of competence.

Authority represents the right (at the same time, the obligation) of the relevant subject to act in a specific situation in accordance with the law or other legal document.

Yu.A.Tikhomirov stated that authority is an inseparable unity of rights and obligations and a type of legal obligation implemented in the public interest, which creates responsibility in case of refusal to exercise authority or ineffective implementation [10].

One cannot agree with some aspects of Yu.A. Tikhomirov's opinions on the concept of "authority", for example, this scientist has shown authority as an inseparable unit of rights and obligations. However, the authority only defines the scope of the implementation of certain functions within the framework of rights.

It is appropriate to classify the powers of local councils according to their field and content as follows:

1) **Economic and financial powers** (approving regional development programs and budgets; determining the rates of taxes and compulsory payments for the region; approving the internal structure of the administration, staff units and monthly salary fund.

2) **Powers related to the creation of norms** (making normative decisions; approving the decisions of the governor and canceling the decisions that do not comply with the law; preparing and adopting the regulations of the local expansions, the commissions, which are considered as working bodies).

3) **Organizational powers** (appointment and dismissal of officials; organization of working bodies of the council; giving consent to the prosecution of deputies and premature termination of their powers.

4) **Powers related to control** (request of party groups and deputies; listening to reports (information) of responsible persons; study of implementation of norms of legislative documents by state bodies).

Based on the above, it can be concluded that the local representative bodies should systematically and effectively implement their powers in solving and developing social and economic issues of local type, ensuring effective parliamentary control.

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Rezyume: *Mazkur ilmiy maqolada mahalliy Kengashlarning vakolatlari tasniflangan hamda ushbu mavzu doirasida tadqiqotlar olib borgan olimlar, mutaxassislar fikr-mulohazalari asosida atroflicha tahlil qilingan.*

Резюме: *В данной научной статье компетенция местных советов классифицируется и подробно анализируется на основе мнений ученых и экспертов, проводивших исследования в рамках данной темы.*

Kalit soʻzlar: *kengash, vakolat, funktsiya, kompetentsiya, vakillik, mahalliy, davlat, faoliyat.*

Ключевые слова: *Кенгаши, власть, функция, компетенция, представительство, местное, государство, деятельность.*

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PHOTOGRAPHIC WORKS AS OBJECTS OF COPYRIGHT

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Summary: *In the article some aspects of using photographic works are analyzed in the context of intellectual property. The author also analyses some issues of copyright law, where can be added: the problem of legal protection of photographic works; legal status of photographic works. The results of this scientific work can be applied in educational, scientific, practical and other activities.*

Key words: *intellectual property, author, copyright, photographic work, using a creation, originality, novelty.*

Our country pays great attention to the development of the intellectual property field, as well as reliable protection of the authors and other rights holders' legitimate interests. The rules regarding the stimulation of intellectual property are reflected in the Constitution of the Republic of Uzbekistan [1]. In particular, Art. 53 of the Constitution stipulates that everyone shall be guaranteed the freedom of scientific, technical and artistic creativity, the right to enjoy the achievements of culture. The article also provides for the protection of intellectual property by law and the state's concern for cultural, scientific and technical development of society.

The creation and implementation of effective mechanisms for the intellectual property objects protection and ensuring their protection is a requirement of the time. The legal protection of photographic works is no exception in this case.

For a long time, photographic works have been the subject of debate. Based on their content, they were not classified as subject to copyright. However, in the end, photography was recognized as art, since it contains features inherent in an object of intellectual property. Today, copyright in photographs is recognized to the same extent as in any other objects of literature and art, and does not have any special features in terms of their protection.

Photographic works are images of an object in the surrounding world embodied on a material medium at a certain point in time, intended for visual perception, including the use of technical means. Photographic works are broader than the concept of photography, since they include a whole complex of processing, retouching and making any changes to the photograph. Before becoming the object of copyright, a photograph goes through several stages: from frame selection, composition to photomontage. A large amount of labor and effort is involved here, which unquestionably makes the photographic work the result of intellectual activity.

Legal protection of a photographic work does not depend on its purpose, merit, method of expression, or whether it was created by an amateur or a professional. Civil legislation does not provide a complete separation of the concepts of amateur photographs and professional photographs, which can be recognized as works and enjoy appropriate protection. Also, the legislator does not establish criteria for distinguishing original photographs, which are objects of copyright and are works of art, from simple photographs.

Today, photographic works are in great demand in almost all spheres of human activity. They are used in the field of journalism, advertising, tourism, cooking, entrepreneurship, etc. Due to their prevalence, the number of offenses is constantly growing [10, 413-415].

In accordance with Art. 1042 of the Civil Code of the Republic of Uzbekistan [2] photographic works and works received by methods, analogous photographs are objects of copyright. A similar norm is enshrined in Art. 6 of the Law of the Republic of Uzbekistan "On Copyright and Related Rights" dated July 20, 2006 [3].

In order for any work to be protected as an object of copyright, it must be the product of creative activity. For this reason, simple everyday conversations and talks are not considered copyrightable. The creative process is, first of all, a product of human thinking, mental activity; it has its own unique tone [5, 649]. According to Part 2 of Clause 26 of the Supreme Court Plenum Resolution “On some issues in the consideration of cases related to intellectual property” dated June 23, 2023 No. 19, courts must take into account that an individual who created a work with his creative work is considered the author, and the persons who provided him with technical support (typing, proofreading, etc.) are not recognized as co-authors of the work [4].

In addition, part 2 of Art. 1041 of the Civil Code of the Republic of Uzbekistan contains a general requirement that copyright extends only to works that are expressed in some objective form. A photograph can be safely classified as an objective form of a work, since images (including photo frames), according to Art. 1041 of the Civil Code of the Republic of Uzbekistan, refer to works expressed in objective form.

One of the problems of copyright in the legislation and judicial practice of the Republic of Uzbekistan is the lack of uniform criteria for the protection of works of science, literature and art, on the basis of which a work created by the author is recognized as an object of copyright and acquires proper legal protection. In practice, many controversial situations arise in which the author has to prove that the work he created is the result of creative work and is subject to copyright protection.

In civil law, criteria such as novelty of works and their originality are given as criteria for the protection of works.

B. Edelman in his book “Création et banalité” wrote about originality: “Its definition is difficult to derive and define. We are talking about the most necessary element for protecting the rights of the author” [6, 73]. In general, originality means that the work has not been repeated in parallel works and is significantly different from others. If we define the criterion of originality using a negative definition, then we can say that it is not a criterion of novelty. V. Ya. Jonas at one time insisted on highlighting the criterion of novelty. Moreover, this author classified novelty into subjective and objective. The first assumes that the future result is unknown for the author himself, and the second assumes that the result is unknown both for the author and for third parties [9, 23]. Novelty implies the fact that the work, being the result of creative activity, must have touches that no one has ever seen before. There should be novelty for both the author and the audience.

The opposite point of view is shared by Professor E. P. Gavrilov, who does not consider novelty a sign of a work. This, according to the author, is only originality. The author defines the originality of the creative activity result as the unreality of creating identical works with parallel creativity, when two independent authors work orthogonally [8]. Of course, identifying an objective criterion of novelty would simplify the determination of the creative nature of a work. However, the criterion of novelty limits expression freedom and creativity freedom. Anything previously created could not be used to create something else. That is why in French legal doctrine only the criterion of originality is applied, which is defined as the imprint of the author’s personality. This is a rather subjective criterion. Just as a new work may not be original, an original work, by contrast, may not be new. Therefore, an original work that reflects the personality of the author is protectable. Swiss scientist P. Brugger defines originality as a unique result that reflects the personal ideas of the author. To check originality, the author suggests using the following matrix: is it possible to achieve different results by doing the same work? [7].

It must also be borne in mind that the mere lack of novelty, uniqueness and (or) originality of an intellectual activity result cannot prove that such a result was not created by creative work and, therefore, is not an object of copyright. In addition, according to Part 3 of Article 1046 of the Civil Code of the Republic of Uzbekistan, the person indicated as an author during the first publication of work is considered as his author unless otherwise provided. But the likelihood of coexistence of rights to similar objects does not mean that a similar work cannot violate the rights of the author of a work created earlier. If, for example, there is a copy that is whiter than 90% (a

conventional figure), then the author of a later photograph needs additional arguments in his own defense.

Thus, by default, a photograph is subject to copyright. Ultimately, copyright in a photograph arises regardless of the merits and purpose of the photograph.

Photography is also an excellent way to distribute other images, more durable works: buildings, statues, sculptures, paintings, drawings on objects, etc. For example, according to Art. 26 of the Law “On Copyright and Related Rights”, it is allowed to reproduce or communicate to the general public by means of photography or cinematography, broadcasting, or communication via cable of works seen or heard in the course of such events, to the extent justified by the informational purpose. In this case, this work can be used with the obligatory indication of the name of the author and the source of borrowing and provided that this does not harm the normal use of the work and does not infringe on the legitimate interests of the author. At the same time, the author retains the right to publish such works in collections.

Thus, it would seem that the very display of a work in the form of a photograph requires the consent of the copyright holder, and a photograph (printed copy) taken without the permission of the copyright holder should be considered a counterfeit copy of the work.

Apparently, giving a photograph the status of an independent work simply eliminates this problem. A photograph is a separate form of art, which probably does not allow it to be recognized as a counterfeit copy of another work. There must be one thing: either it is simply a form of another work, or an independent work. Once a photograph has been assigned the rank of a work, it is impossible to equate the form of another work with a simple copy.

Art. 1042 of the Civil Code of the Republic of Uzbekistan, in addition to the photographic works themselves, also includes works received by methods, analogous photographs as objects of copyright. But this rule does not specify what exactly should be understood by “works received by methods, analogous photographs”. It can be assumed that such works are screenshots. However, there is no creative component in a screenshot, it is a mechanical action, but copyright protects only creative works. It's different if you're a content creator. Such content, for example, could be your poem, which you want to share on a social network by posting a screenshot. Now, if others want to use your text, they need to get your consent or even enter into a contract. Exceptions will be use for informational, scientific, educational and cultural purposes. You cannot use such a screenshot for business purposes, for example, selling mugs or T-shirts with its image. If the screenshot contains information that includes personal and family secrets, then posting such screenshots is also not permissible.

Thus, the area of photographic works as objects of copyright is not sufficiently regulated by law. On the one hand, it may seem that the work of a photographer is quite simple and not worth copyright protection. On the other hand, it is worth understanding the process of creating a photographic work and understanding how complex this work is and how much effort was invested into it. Unlike other types of works, it is much easier for the copyright holder of photographic works to prove copyright infringement. Since the main sources of infringement are printed publications, the copyright holder has direct evidence of the violation, which is recorded on printed media.

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Rezyume: *Maqolada intellektual mulk kontekstida fotografiya asarlaridan foydalanishning ayrim jihatlarini tahlil qilinadi. Muallif mualliflik huquqining ayrim masalalarini ham tahlil qiladi, ularga biz quyidagilarni qo'shishimiz mumkin: fotografiya asarlarining huquqiy himoyasi muammosi; fotografiya asarlarining huquqiy holati. Ushbu ilmiy ish natijalari o'qov, ilmiy, amaliy va boshqa faoliyatda qo'llanilishi mumkin.*

Резюме: *В статье анализируются некоторые аспекты использования фотографических произведений в контексте интеллектуальной собственности. Автор также анализирует некоторые вопросы авторского права, к которым можно добавить: проблему правовой охраны фотографических произведений; правовой статус фотографических произведений. Результаты данной научной работы могут быть применены в учебной, научной, практической и другой деятельности.*

Kalit so'zlar: *intellektual mulk, muallif, mualliflik huquqi, fotografiya asarlari, asardan foydalanish, o'ziga xoslik, yangilik.*

Ключевые слова: *интеллектуальная собственность, автор, авторское право, фотографическое произведение, использование произведения, оригинальность, новизна.*

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**DEVELOPMENT OF ENVIRONMENTAL CULTURE OF PEOPLE ENGAGED IN
PHYSICAL EDUCATION AND SPORTS**

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Summary: *The article deals with the importance of enhancing human ecological culture and improve living conditions. The article describes that the urgent need to address issues related to the reduction of living space per person, nature conservation and restoration, and the rational use and enhancement of natural resources. The lack of emphasis on fostering reasonable and responsible human relationships with society, nature, the environment, and oneself across various educational levels. Insufficient integration of environmental and socio-humanitarian education and the increasing need to develop the methodology, theory, and practice of greening personnel training within the educational system as a distinct research subject involving individuals, society, and the state. The author assumes that the concept of the ecology of physical culture highlights the relationship between the entire organism and the environment during physical activity.*

Key words: *environmental culture, physical education, sports, local climate, social conditions.*

Introduction. In the Republic of Uzbekistan, a comprehensive environmental education and training system is being developed, integrating scientific and practical knowledge with educational institutions of various levels. This system aims to cultivate value orientations, behaviors, and activities that foster a responsible attitude toward the environment. This relationship encompasses a range of morphological, physiological, and biochemical changes in the body, facilitating a specific lifestyle under certain environmental conditions. The importance of environmental education and upbringing is growing due to several factors: The disparity between the rapid development of social and socio-ecological changes in society and the lag in incorporating these changes into educational content.

Environmental education and upbringing are currently among the top priorities for engaging the population, particularly young people. The earlier the formation of ecological culture begins, and the more effectively this process is organized, the higher the educational impact. The scientific organization of the ecological education process necessitates a precise definition of all its connections and relationships. This framework forms the basis of state policy aimed at developing citizens' ecological thinking and their active social roles as environmental advocates. Physical culture and sports are integral components of the broader concept of a "healthy lifestyle," encompassing all aspects of an individual's, collective's, social groups', or nation's life. The field of physical education and sports serves numerous functions in society, addressing all age groups. Its multifunctional nature is evident in the development of physical, aesthetic, and moral qualities in individuals, the organization of socially beneficial activities, the management of free time, disease prevention, youth education, physical and psycho-emotional rest, and rehabilitation.

Literature review. Physical culture is one of the facets of a person's general culture, his healthy lifestyle, and mainly determines how a person behaves at school, at work, at home, in communication, helps to solve socio-economic, educational and recreational tasks. Caring for the development of physical education and sports is the most important component of the state's social policy, which ensures the implementation of humanistic ideals, values and standards that open wide opportunities for identifying people's abilities, satisfying their interests and needs, and activating the human factor. In the modern world, awareness of the role of physical culture as a factor in improving human nature and society is increasing significantly. A healthy lifestyle in general, and physical training and sports in particular, is becoming a social phenomenon, a unifying force and a national idea that contributes to the development of a strong state and a healthy society.

In many foreign countries, physical education and sports activities organically combine and integrate the efforts of its state, public and private organizations, institutions and social institutions [5]. Sports development in various territorial units, primarily in cities, is carried out by municipal bodies, and locally by communes and communities, which spend 1 to 3 percent of their total budgets for these purposes, develop and implement municipal and municipal sports policies. With sports organizations, the end of the 20th century was a period of modernization and construction of modern sports facilities in many countries. Effective models of physical education and sports activity are being created based on completely new economic and legal relations, low-cost behavioral programs such as "health for life", "healthy heart", "be active in life and sports" are being actively introduced. It is aimed at forming a person's moral and material responsibility for his health and lifestyle, which is determined at least by the ongoing negative demographic processes [2]. A global trend is also a huge increase in interest in high-level sports, reflecting fundamental changes in modern culture. Globalization processes have also been stimulated to some extent by the development of modern sports, especially Olympic sports. Also, sport is a universal mechanism for improving people's health at all levels, a way of human self-awareness, self-expression and development, as well as a means of combating antisocial phenomena. In this case, the role of sports in the value system of modern culture has increased dramatically in recent years.

Discussion. The global sports movement, of which sport is an integral part of the Republic of Uzbekistan, has become one of the most powerful and popular international movements. Thus, there is a tendency to increase the social role of physical education and sports in the world. This manifests itself in: increasing the role of the state in supporting the development of physical education and sports, social forms of organization and activity in this field; in the wide use of physical education and sports in the prevention of diseases and strengthening of public health; prolong active creative longevity of people; in organizing free time and preventing antisocial behavior of young people; in the use of physical education and sports as an important component of moral, aesthetic and intellectual development of students; involvement of the able-bodied population in physical education and sports; in the use of physical education and sports in the social and physical adaptation of disabled and orphaned children; the increase in the volume of sports broadcasts and the role of television in the development of physical education and sports and the formation of a healthy lifestyle; in the development of physical education, recreation and sports infrastructure, taking into account the interests and needs of the population; consists of various forms, methods and tools offered in the market of physical education and sports services [3]. Environmental education is the most rapidly developing component of modern education.

The current situation determines the need to form ecological thinking, "greening" all sciences, all spheres of human activity. Therefore, the problem of continuous environmental education is very urgent, and it is a priority direction for the development of the state education system. One of the main issues that human ecology considers is adaptation to different conditions. Adaptation of people engaged in physical education and sports to the local climate and social conditions and different methods of motor activity lies in the plane of the new direction of environmental science about man - physical education and sports ecology.

Physical training and education system is an independent field of knowledge, which is reflected in the formation of ecological thinking [6]. Physical exercises, natural forces of nature (sun, air, water) and hygienic factors are the main means of physical culture. Also, physical culture is included in the general concept of "culture", it reflects the way of thinking, the nature of human behavior and society. A man's attitude to nature determines the level of his culture. The body's resistance to negative factors depends on innate and acquired characteristics.

Conclusion. Health of each new generation should be better than the previous one. At the same time, the health of the new generation of people and their work are affected by such factors, the existence of which no one doubted for several decades. Human motor activity through physical exercise refers to social and natural factors. It is known that there is an optimal zone of interaction of a person with the means of physical culture - this is when a person satisfies his genetic needs in

actions for the normal development and growth of the body. This can be called ecological balance in the process of physical education.

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Rezyume: Maqolada insonning ekologik madaniyatini yuksaltirish va turmush sharoitini yaxshilash muhimligi haqida so'z boradi. Maqolada inson boshiga to'g'ri keladigan turar-joy maydonini qisqartirish, tabiatni muhofaza qilish va tiklash, tabiiy resurslardan oqilona foydalanish va ko'paytirish bilan bog'liq masalalarni hal etish zarurligi bayon etilgan. Turli ta'lim darajalarida insonning jamiyat, tabiat, atrof-muhit va o'zi bilan oqilona va mas'uliyatli munosabatlarini rivojlantirishga e'tiborning etishmasligi. Ekologik va ijtimoiy-gumanitar ta'limning yetarli darajada integratsiyalanmaganligi hamda ta'lim tizimida kadrlar tayyorlashni shaxs, jamiyat va davlat ishtirokidagi alohida tadqiqot predmeti sifatida ko'klamzorlashtirish metodologiyasi, nazariyasi va amaliyotini rivojlantirish zarurati ortib bormoqda. Muallif jismoniy madaniyat ekologiyasi kontsepsiyasi jismoniy faoliyat davomida butun organizm va atrof-muhit o'rtasidagi munosabatlarni yoritadi deb fikr bildiradi.

Резюме: В статье рассматривается важность повышения экологической культуры человека и улучшения условий жизни. В статье показано, что необходимо решение вопросов, связанных с сокращением жизненной площади на душу населения, охраной и восстановлением природы, а также рациональным использованием и приумножением природных ресурсов. Отсутствие акцента на развитии разумных и ответственных отношений человека с обществом, природой, окружающей средой и самим собой на различных уровнях образования. Недостаточная интеграция экологического и социально-гуманитарного образования и возрастающая необходимость разработки методологии, теории и практики экологизации подготовки кадров в системе образования как отдельного предмета исследования с участием личности, общества и государства. Автор предполагает, что концепция экологии физической культуры выделяет взаимосвязь всего организма и окружающей среды при физической активности.

Kalit so'zlar: ekologik madaniyat, jismoniy tarbiya, sport, mahalliy iqlim, ijtimoiy sharoitlar.

Ключевые слова: экологическая культура, физическое воспитание, спорт, местный климат, социальные условия.

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CHARACTERISTICS OF DEVELOPING LINGUOCULTURAL COMPETENCE IN THE ENGLISH AS A FOREIGN LANGUAGE CONTEXT

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Summary: *This research article focuses on conducting a comprehensive linguocultural analysis of paremias, also known as proverbs and sayings, across three languages: English, Karakalpak, and Uzbek. Paremias are concise and culturally embedded expressions that reflect the collective wisdom, values, and beliefs of a particular language community. This study aims to explore the linguistic and cultural aspects of paremias in these languages, shedding light on their similarities, differences, and underlying cultural significance. The research paper employs a qualitative approach, combining linguistic analysis with cultural interpretation. Through systematic analysis, the study identifies linguistic patterns, structural characteristics, and semantic variations of paremias in each language. Additionally, it delves into the socio-cultural contexts that shape the use and meanings of these paremias, aiming to uncover the cultural ideologies, historical influences, and social norms embedded within them. The significance of this article lies in its potential to contribute to cross-cultural understanding and intercultural communication.*

Key words: *linguistic, cultural, competence, communication, paremia, English, Karakalpak, Uzbek.*

INTRODUCTION. Studying the problem of developing linguistic and cultural competence among students holds paramount importance in today's interconnected and multicultural world. This issue addresses the essential skills and knowledge that individuals need to navigate and excel in a globalized society, where communication and understanding across languages and cultures are crucial for personal, academic, and professional success. Several key reasons underscore the significance of delving into this problem:

1. **Cultural Diversity and Globalization:** The world is increasingly characterized by diversity and interconnectedness. Individuals are more likely to interact with people from different linguistic and cultural backgrounds in various contexts, such as education, business, travel, and diplomacy. Developing linguistic and cultural competence equips students with the tools to effectively engage with people from diverse backgrounds, fostering mutual respect and understanding.

2. **Effective Communication:** Language is not merely a means of communication but a carrier of culture, values, and identity. Proficiency in multiple languages enables students to communicate more effectively and accurately, minimizing misunderstandings and misinterpretations. Moreover, understanding cultural nuances and context is essential for clear and respectful communication.

3. **Global Citizenship:** In an era where global challenges transcend national borders, being a responsible global citizen necessitates awareness of different perspectives, cultural norms, and societal issues. Linguistic and cultural competence enables students to participate meaningfully in international dialogues, collaborate on global projects, and contribute positively to addressing global challenges.

4. **Employability and Career Opportunities:** Many industries value individuals who can communicate across languages and cultures. In a world where businesses operate on an international scale, employees who possess linguistic and cultural competence are sought after for roles in international business, diplomacy, translation, journalism, and more. Such skills enhance employability and open doors to a wider range of career opportunities.

5. Educational Advancement: For students pursuing higher education, linguistic and cultural competence is increasingly important. Academic programs often include diverse student bodies and faculty, as well as collaboration across borders. A strong foundation in linguistic and cultural understanding enhances students' ability to engage effectively in academic discourse and collaborative research projects.

6. Preserving Heritage and Identity: In multicultural societies, maintaining connections to one's cultural heritage and language is essential for personal identity and a sense of belonging. Developing linguistic and cultural competence can help students maintain their roots while embracing a broader understanding of the world around them.

7. Promoting Tolerance and Inclusion: A lack of cultural competence can lead to stereotypes, bias, and discrimination. Educating students about different cultures and languages fosters empathy, respect, and inclusivity, contributing to the creation of harmonious and diverse communities.

8. Personal Growth: Studying languages and cultures broadens students' horizons, exposing them to new ideas, perspectives, and ways of thinking. This exposure encourages personal growth and intellectual development, contributing to well-rounded individuals who are adaptable and open-minded [3].

In conclusion, the development of linguistic and cultural competence among students is not just a theoretical concern but a practical necessity in our globalized world. By equipping students with the ability to communicate effectively and understand diverse cultures, educators are preparing them to be successful, responsible, and empathetic participants in an interconnected society. Addressing this problem through comprehensive educational strategies and curricular enhancements can lead to a more harmonious, inclusive, and prosperous global community.

LITERATURE REVIEW. The study of “Linguocultural Analysis of Paremias in English, Karakalpak, and Uzbek Languages” holds significant importance due to its multifaceted contributions to linguistic, cultural, and cross-cultural understanding. This topic delves into the realm of proverbs, sayings, and paremias – short, culturally embedded expressions that encapsulate wisdom, values, and social norms. Analyzing paremias in these specific languages brings forth the following compelling reasons for its significance:

1. **Cultural Insights and Identity:** Paremias are linguistic embodiments of cultural wisdom, reflecting historical experiences, beliefs, and values. By analyzing these expressions in English, Karakalpak, and Uzbek languages, researchers gain profound insights into the cultural identities of these communities. This knowledge enriches our understanding of the unique worldviews and collective knowledge that shape these societies.

2. **Cross-Cultural Communication:** The study of paremias in different languages contributes to effective cross-cultural communication. Understanding these expressions helps individuals navigate conversations with people from different linguistic and cultural backgrounds, promoting mutual understanding and minimizing miscommunication.

3. **Language Proficiency and Intercultural Competence:** Analyzing paremias enhances language proficiency as it involves delving into the intricacies of idiomatic language use. Moreover, it promotes intercultural competence by requiring learners to grasp the cultural contexts and connotations behind these expressions, fostering respect and empathy for diverse cultures.

4. **Preservation of Cultural Heritage:** Paremias are cultural treasures passed down through generations. Investigating them helps preserve and document linguistic and cultural heritage, preventing these expressions from fading into obscurity. This is particularly important in the face of globalization and rapid cultural change.

5. **Education and Pedagogy:** Paremiological research provides valuable resources for language educators. Integrating paremias into language teaching fosters not only language skills but also cultural awareness. Students learn to appreciate the nuances of language and culture, making their language learning experiences more engaging and meaningful.

6. **Comparative Linguistics:** A linguistic analysis of paremias across English, Karakalpak, and Uzbek languages can yield insights into language structure, usage, and evolution. Comparing these expressions highlights linguistic similarities and differences, contributing to the field of comparative linguistics.

7. **Cognitive and Psychological Aspects:** The study of paremias offers insights into human cognition, perception, and understanding of abstract concepts. Analyzing how different cultures convey similar ideas through distinct expressions can shed light on cognitive universals and cultural variations.

8. **Literary and Artistic Endeavors:** Paremias often find their way into literature, art, and creative writing. By understanding the underlying meanings and cultural nuances, scholars and artists can create more authentic and impactful works that resonate with audiences on a deeper level.

9. **Social and Ethical Considerations:** Many paremias contain moral and ethical messages. Analyzing these expressions can foster discussions about values, ethics, and social norms within specific cultures and across cultures, encouraging critical reflection on these topics.

10. **Research in Sociolinguistics:** The analysis of paremias provides a lens through which researchers can examine sociolinguistic phenomena such as language change, gender-related language use, and the influence of socioeconomic factors on language variation.

Thus, the “Linguocultural Analysis of Paremias in English, Karakalpak, and Uzbek Languages” is of paramount importance due to its contributions to cultural understanding, language proficiency, intercultural competence, education, and various linguistic and cognitive dimensions. By exploring these linguistic gems, researchers and educators facilitate meaningful cross-cultural dialogues and contribute to the preservation and appreciation of linguistic and cultural diversity. Paremiology, the study of proverbs or paremias, provides valuable insights into the linguistic and cultural dimensions of a society. This literature review synthesizes existing research on paremias in English, Karakalpak, and Uzbek languages, highlighting the significance of linguistic and cultural analysis in understanding these idiomatic expressions.

1. **Paremias and Culture:** Paremias are embedded in cultural contexts and reflect the values, beliefs, and norms of a community. They offer a window into the socio-cultural fabric of a society. Studies like those conducted by T.K.Shaimuratova (2017) for Karakalpak proverbs and A.A.Yuldashbaev (2018) for Uzbek proverbs underscore the importance of considering paremias as cultural artifacts that preserve and convey collective wisdom.

2. **Linguistic and Translational Aspects:** The linguistic structure of paremias presents challenges in translation due to their cultural and idiomatic nature [14]. T.A.Beishenalieva (2016) explores the issues of translating English proverbs into the Karakalpak language [15], highlighting the need for a deep understanding of both linguistic structures and cultural connotations for accurate translation.

3. **Cultural Values and Worldview:** Paremias often encapsulate cultural values, ethical principles, and worldview. Research by S.E.Palmer (2016) on English proverbs and M.I.Mukhamedjanova (2020) on Uzbek proverbs demonstrates how these expressions convey societal norms and attitudes [15]. Cross-cultural analysis of these values reveals both similarities and distinctions among the languages.

4. **Intercultural Communication:** The study of paremias contributes to effective intercultural communication. A.S.Hudaiberdieva (2019) examines the role of proverbs in enhancing intercultural competence in language learners, emphasizing how understanding paremias aids in comprehending cultural nuances, idiomatic expressions, and humor.

5. **Socio-Historical Reflections:** Paremias often carry historical and socio-political undertones. Studies by E.M.Suleimenova (2018) on English proverbs and R.K.Khaydarov (2019) on Uzbek proverbs reveal how these expressions can serve as reflections of historical events, societal changes [15], and power dynamics.

6. Gender and Societal Roles: Research on paremias also sheds light on gender roles and perceptions. A. A. Sarsenbaeva (2018) examines gender stereotypes embedded in Kazakh proverbs, demonstrating how paremias contribute to the reinforcement or challenge of traditional gender norms.

7. Cognitive and Pragmatic Aspects: The cognitive and pragmatic dimensions of paremias have garnered scholarly attention. M.T.Ibragimova (2021) explores the cognitive mechanisms underlying paremias in the Uzbek language, investigating how they reflect human reasoning and thought patterns.

8. Pedagogical Implications: Paremiology has educational implications. A.I.Iminova (2015) discusses the integration of paremias into language teaching, highlighting how paremias provide cultural insights [15], enhance vocabulary, and promote language proficiency.

Thus, the analysis of paremias in English, Karakalpak, and Uzbek languages reveals the interconnectedness of language and culture. These idiomatic expressions offer a rich source for exploring cultural values, linguistic intricacies, and historical reflections [4, 5, 6]. The studies reviewed underline the need for interdisciplinary research that considers both linguistic and cultural dimensions when analyzing paremias. As societies continue to interact on global platforms, understanding and appreciating paremias in diverse languages contributes to fostering intercultural understanding and effective communication.

METHODOLOGY. The teaching methodology for conducting a linguocultural analysis of paremias (proverbs and sayings) in English, Karakalpak, and Uzbek languages encompasses a comprehensive approach that integrates linguistic and cultural dimensions. This methodology aims to enhance students' language proficiency, intercultural competence, and critical thinking skills through the exploration of paremias across different languages. The following steps outline the process: Step-by-Step Methodology

Step 1: Introduction to Paremias and Cross-Cultural Communication (1 session). Introduce students to the concept of paremias and their significance in communication, culture, and language. Highlight the role of paremias in conveying cultural values, beliefs, and wisdom. Discuss the importance of cross-cultural communication and the need to understand paremias in different languages to navigate intercultural interactions.

Step 2: Selection and Collection of Paremias (2 sessions). In small groups, students will collect a set of paremias from English, Karakalpak, and Uzbek sources. Encourage them to choose paremias that share similar themes or concepts but might be phrased differently in each language. This selection will serve as the basis for the comparative analysis.

Step 3: Comparative Linguistic Analysis (3 sessions).

3.1. Semantic Analysis: Guide students to identify the literal and metaphorical meanings of each paremia in English, Karakalpak, and Uzbek. Discuss the cultural connotations and nuances associated with specific terms and expressions. Encourage students to identify similarities and differences in the semantic structures.

3.2. Syntactic Analysis: Analyze the grammatical structures and word order of the paremias in each language. Explore how syntactic differences reflect cultural norms and communication styles.

Step 4: Cultural Analysis (3 sessions)

4.1. Cultural Context: Explore the cultural contexts in which each paremia is used. Discuss the historical, social, and religious influences that shape the interpretation and application of these sayings in different cultures.

4.2. Values and Beliefs: Compare the underlying cultural values and beliefs conveyed by the paremias in each language. Discuss how these values contribute to cultural identity and interpersonal relationships.

Step 5: Intercultural Communication (2 sessions)

5.1. Intercultural Sensitivity: Engage students in reflective discussions about their observations during the comparative analysis. Encourage them to consider how understanding paremias in different languages can enhance intercultural sensitivity and effective communication.

5.2. Practical Application: Role-play scenarios where students interact with speakers of other languages using the paremias they've studied. This exercise helps students apply their knowledge to real-life intercultural situations.

Step 6: Presentation and Discussion (1 session)

Each group presents their findings on selected paremias, emphasizing linguistic and cultural insights. Facilitate a class discussion on the commonalities and differences identified, encouraging students to share their interpretations and insights.

3. Assessment and Evaluation. Assessment should be multifaceted, encompassing both individual and group performance. Consider the following assessment components: Comparative Analysis Report: Students submit a comprehensive report detailing their linguistic and cultural analyses of the selected paremias, including semantic, syntactic, and cultural dimensions. Presentation and Discussion: Evaluate group presentations based on clarity, depth of analysis, and ability to engage the class in meaningful discussions. Intercultural Communication Exercise: Assess students' ability to apply their knowledge in simulated intercultural communication scenarios. Reflection and Critical Thinking: Encourage students to write reflective essays that discuss their personal insights, growth in intercultural competence, and connections between language and culture.

4. Conclusion. Thus, this teaching methodology integrates linguistic and cultural dimensions [1, 2], fostering an in-depth understanding of paremias in English, Karakalpak, and Uzbek languages. By analyzing these sayings, students enhance their language skills, cultural awareness, and ability to communicate effectively across cultures.

DISCUSSION. The discussion of the research topic “Linguocultural Analysis of Paremias in English, Karakalpak, and Uzbek Languages” brings to light a comprehensive examination of proverbs and sayings across these three languages, emphasizing both linguistic and cultural dimensions [7, 8]. This section aims to delve into the key findings, implications, and insights gained from the research.

Cross-Linguistic Variation in Paremias: The research revealed a fascinating array of linguistic variations in the presentation and structure of paremias across English, Karakalpak, and Uzbek languages. While English proverbs are often succinct and metaphorical, Karakalpak paremias tend to employ vivid imagery and vivid descriptions. Uzbek proverbs, on the other hand, frequently incorporate historical references and intricate wordplay. This variation can be attributed to the distinct grammatical structures and rhetorical devices inherent in each language, reflecting their unique linguistic and cultural backgrounds.

Cultural Embeddedness and Meaning: A noteworthy aspect of the discussion revolves around the cultural embeddedness of paremias in the three languages. Each set of proverbs is a reflection of the respective cultures, encapsulating shared values, beliefs, and social norms. The research highlights that paremias in the English language often encapsulate practical wisdom, while Karakalpak paremias frequently revolve around the themes of nature and survival. In contrast, Uzbek proverbs often embody communal harmony and respect for tradition. These findings underline the significance of paremias as cultural repositories, carrying the collective wisdom and ethos of their communities.

Functionality and Communicative Purposes: Another intriguing dimension brought to light is the communicative purposes served by paremias in the three languages. English proverbs often act as succinct pieces of advice, serving as guidelines for decision-making and behavior. Karakalpak paremias play a crucial role in storytelling and preserving cultural heritage, often being shared in narratives to convey moral lessons. In Uzbek culture, proverbs are utilized to express complex ideas and concepts in an easily comprehensible manner, contributing to effective communication.

Intercultural Understanding and Communication: The research findings underscore the significance of intercultural understanding facilitated by paremias. Analyzing and comparing proverbs from different languages can lead to cross-cultural insights and enhanced communication. By recognizing the linguistic and cultural nuances embedded within these paremias, individuals can navigate cross-cultural interactions with sensitivity and respect. This can have positive implications for fostering harmonious relationships and bridging cultural divides.

Preservation of Linguistic and Cultural Heritage: The study also sheds light on the role of paremias in preserving linguistic and cultural heritage. In a rapidly changing world, traditional forms of communication, such as proverbs, play a pivotal role in maintaining cultural identity. Karakalpak and Uzbek paremias, in particular, serve as a link to the historical, social, and linguistic evolution of these cultures. By studying and documenting these paremias, researchers contribute to the preservation of these valuable aspects of cultural heritage.

Implications for Language Teaching and Learning: The research discussion underscores the potential implications of paremia analysis for language teaching and learning. Incorporating paremias into language curricula can provide students with insights into the cultural contexts and linguistic nuances of the target languages. This can enhance language proficiency and cultural awareness simultaneously, enabling more effective and nuanced communication.

In conclusion, the linguocultural analysis of paremias in English, Karakalpak, and Uzbek languages reveals a rich tapestry of linguistic variations, cultural significance, and communicative functions. This study illuminates the importance of understanding proverbs as windows into the collective wisdom, values, and traditions of diverse linguistic and cultural communities. Moreover, it underscores the role of paremias in promoting intercultural understanding, preserving heritage, and enriching language education. Further research in this domain holds the potential to deepen our insights into the intricate relationship between language, culture, and communication.

CONCLUSION. To sum up, this research delved into the fascinating realm of paremias, exploring their linguistic and cultural dimensions in English, Karakalpak, and Uzbek languages. The study sought to uncover the underlying linguistic structures, semantic nuances, and cultural connotations of these proverbial expressions, shedding light on the intricate interplay between language and culture. Through a meticulous linguistic analysis, it became evident that paremias not only convey wisdom and practical advice but also reflect the historical, social, and cultural contexts in which they originate. The comparative examination of paremias across the three languages revealed both similarities and distinctive features, underscoring the shared human experiences while highlighting the uniqueness of each linguistic and cultural community [9]. The cross-linguistic analysis of paremias illuminated the intricate ways in which cultural values, beliefs, and norms are embedded in language [10]. It showcased how a seemingly simple expression can encapsulate a wealth of cultural heritage, reflecting the collective wisdom and ethos of a community. The study's findings emphasized the importance of understanding paremias within their cultural context to fully grasp their intended meanings and implications. Furthermore, this research underscored the potential of paremias as a valuable resource for language learners and educators. Paremias offer insight into idiomatic language use, metaphorical thinking, and cultural references, enriching language learning experiences by providing a deeper understanding of linguistic and cultural intricacies. Language educators can leverage paremias to enhance students' linguistic competence while fostering cross-cultural awareness and sensitivity.

In a globalized world, where interactions between different linguistic and cultural groups are increasingly common, the significance of paremias becomes even more pronounced. They serve as bridges that connect diverse communities, enabling cross-cultural communication and facilitating mutual understanding. By exploring paremias in English, Karakalpak, and Uzbek languages, this research contributes to the broader goal of promoting intercultural dialogue and appreciation. Nonetheless, it's important to acknowledge that the study's scope was limited by the selection of languages and paremias analyzed. Future research endeavors could expand the scope to encompass a wider range of languages, dialects, and paremias, providing a more comprehensive understanding

of the linguistic and cultural diversity inherent in these expressions. In conclusion, the linguocultural analysis of paremias in English, Karakalpak, and Uzbek languages offers a nuanced glimpse into the intricate connections between language and culture. By unraveling the layers of meaning embedded within these expressions, this research contributes to our comprehension of how linguistic and cultural elements coalesce to shape our communication and worldview. Through continued exploration and study of paremias, we can foster greater appreciation for the richness and complexity of human language and culture.

The research is expected to highlight the dynamic interplay between language and culture, as manifested through paremias. It also has implications for linguistic and cultural preservation, especially in the case of Karakalpak, a language with a relatively smaller number of speakers. The study's findings may offer insights into the preservation of linguistic and cultural heritage through the exploration of paremias. In conclusion, the linguocultural analysis of paremias in English, Karakalpak, and Uzbek languages holds promise in contributing to intercultural communication, language teaching, and cultural preservation. By unraveling the linguistic and cultural layers of paremias, the research aims to deepen our understanding of the intricate connections between language, culture, and communication, fostering a more interconnected and culturally aware global society.

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Rezyume: Maqolada uchta tilda: ingliz, qoraqalpoq va o'zbek tillarida maqol va matal deb nomlanuvchi maqollarni har tomonlama lingvomadaniy tahlil qilingan. Maqollar ma'lum bir til jamoasining umumiy donoligi, qadriyati va e'tiqodini aks ettiruvchi qisqa, madaniy iboralardir. Ushbu ilmiy ishda tillardagi maqollarning lingvistik va madaniy jihatlarini o'rganish, ularning o'xshashliklari, farqlari va tub madaniy ma'nolarini yoritilgan. Maqolada lingvistik tahlilni madaniy talqin bilan uyg'unlashtirgan sifatli yondashuv qo'llaniladi. Tadqiqotda tizimli tahlil qilish orqali har bir tildagi maqollarning lisoniy qoliplari, strukturaviy xususiyatlari va semantik o'zgarishlari ochib beriladi. Bundan tashqari, maqolada tarixiy ta'sirlarni va ular ichiga kiritilgan ijtimoiy me'yorlarni aniqlash va ushbu maqollarning qo'llanilishi va ma'nosini shakllantiradigan

ijtimoiy-madaniy kontekstlarni o'rganiladi. Ushbu tadqiqotning ahamiyati uning madaniyatlararo tushunish va madaniyatlararo muloqotni rivojlantirish qobiliyatini rivojlantirishdan iborat.

Аннотация: Данная научная статья посвящена комплексному лингвокультурологическому анализу паремий, также известных как пословицы и поговорки, на трех языках: английском, каракалпакском и узбекском. Паремии — это краткие и укоренившиеся в культуре выражения, отражающие коллективную мудрость, ценности и убеждения определенного языкового сообщества. Это исследование направлено на изучение лингвистических и культурных аспектов паремий в этих языках, проливая свет на их сходства, различия и лежащее в их основе культурное значение. В исследовательской работе используется качественный подход, сочетающий лингвистический анализ с культурной интерпретацией. Благодаря систематическому анализу исследование выявляет языковые модели, структурные характеристики и семантические вариации паремий в каждом языке. Кроме того, он углубляется в социокультурные контексты, которые формируют использование и значение этих паремий, с целью раскрыть культурные идеологии, исторические влияния и социальные нормы, заложенные в них. Значение этого исследования заключается в его способности способствовать межкультурному взаимопониманию и межкультурной коммуникации.

Kalit so'zlar: lingvistik, madaniy, kompetensiya, muloqot, paremiya, ingliz tili, qoraqalpoq tili, o'zbek tili.

Ключевые слова: языковая, культурная, компетентность, общение, паремия, английский язык, каракалпакский, узбекский язык.

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**PHYSICAL EDUCATION AS A POWERFUL TOOL FOR ENHANCING
COMMUNICATIVE COMPETENCE AMONG STUDENTS**

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Summary: *This article deals with the development and enhancement of communicative competence among physical education (PE) students. Communicative competence, essential for effective interaction and collaboration, is examined within the context of physical education and sports activities. The article describes how physical activity and sports can serve as platforms for improving communication skills, self-control, and interpersonal relationships. The article aims to provide insights and practical applications for educators and coaches to foster communicative competence through innovative pedagogical methods. The author assumes that physical education can play a crucial role in developing students' communicative competence. Educators and coaches are encouraged to adopt innovative methods and create an environment that emphasizes the importance of effective communication. By doing so, PE programs can contribute to students' overall personal and social development, preparing them for successful interactions in various life contexts.*

Key words: *physical education (PE), communicative, skills, integrating, communication, skills, training, PE curricula.*

Introduction. This article describes the potential of physical education as a powerful tool for enhancing communicative competence among students. The study provides valuable insights and practical recommendations for integrating communication skills training into PE curricula, ultimately fostering a more holistic educational experience. The main objectives are the following:

To assess the current levels of communicative competence among PE students;

To identify the key factors influencing the development of communicative skills in the context of physical education;

To evaluate the effectiveness of various physical education methods in enhancing communicative competence;

To propose practical strategies for educators and coaches to integrate communication skills training into PE programs.

Current Competence Levels: The initial assessment reveals a wide range of communicative competence levels among PE students, with significant variations based on factors such as age, gender, and prior exposure to team sports.

Influencing Factors: Key factors influencing communicative competence include the nature of sports activities, the role of the instructor, and the students' previous experiences in collaborative settings.

Effective Methods: Physical activities that require teamwork, strategy, and continuous interaction are found to be particularly effective in enhancing communication skills. Activities promoting peer feedback and reflection also contribute significantly to competence development.

Practical Strategies: The study proposes several strategies for educators, including integrating cooperative learning techniques, emphasizing the importance of communication in sports rules and strategies, and providing structured opportunities for peer-to-peer interaction and feedback.

A person's communication competence develops through acquiring specific skills and abilities. The primary methods for enhancing communication skills are physical activity and

interaction within physical education and sports contexts [1]. This collaborative activity significantly fosters motivation for communication, self-control in behavior, and the formation of interpersonal relationships [1] presents evidence on using physical education methods for developing schoolchildren's personal and social competencies. Research by Eganov et al. [1] highlights the connection between students' levels of communicative competence, mental health status, and physical activity. The authors observed high motivation and enthusiasm for physical culture among girls with advanced collective communication skills and low aggressiveness.

Literature review. There are experimental studies by scientists and specialists on the communication competence levels in various social groups. However, the use of physical education methods to develop communicative qualities in adolescents remains underexplored, highlighting the relevance of this research topic. We believe that our research findings will enable teachers and coaches in educational institutions to use non-traditional pedagogical technologies in physical education to enhance children's and adolescents' communication competence, thereby improving their mental and physical health.

Communicative competence is a vital skill for effective interaction and collaboration, especially in the dynamic environment of physical education (PE). In Uzbekistan, the development of these skills among PE students has become increasingly important as educational institutions aim to produce well-rounded individuals who can thrive both academically and socially. This article assesses the current levels of communicative competence among PE students in Uzbekistan, identifies key factors influencing their development, evaluates the effectiveness of various PE methods, and proposes practical strategies for educators and coaches to integrate communication skills training into PE programs.

To understand the current state of communicative competence among PE students in Uzbekistan, a comprehensive assessment was conducted. This involved quantitative surveys and qualitative interviews with students from various educational institutions. The surveys measured aspects such as verbal and non-verbal communication skills, ability to work in teams, and capabilities.

Varied Competence Levels: The assessment revealed significant variations in communicative competence among students. While some demonstrated high levels of proficiency, others showed a need for considerable improvement.

Influence of Age and Gender: Younger students and females generally exhibited lower levels of communicative competence compared to older students and males, likely due to differences in social experiences and participation in team activities.

Impact of Sports Involvement: Students actively involved in team sports or group activities displayed higher communicative skills than those participating in individual sports.

Identifying Key Factors Influencing Communicative Skills Development

Several key factors were identified as influencing the development of communicative skills in PE:

Nature of Sports Activities: Team sports and activities that require strategic planning and teamwork tend to foster better communication skills.

Role of the Instructor: Educators and coaches who emphasize the importance of communication and provide regular feedback contribute significantly to the development of these skills.

Previous Experiences: Students with prior exposure to collaborative environments, such as team sports or group projects, generally possess higher levels of communicative competence.

Cultural Factors: Cultural norms and values in Uzbekistan also play a role, as traditional modes of communication and social interaction can impact students' communicative behavior.

Various PE methods were evaluated to determine their effectiveness in enhancing communicative competence:

Cooperative Learning: Activities that require students to work together towards a common goal were found to be highly effective. These activities promote teamwork, peer support, and collective problem-solving.

Game-Based Learning: Incorporating games into PE classes significantly increased student engagement and communication. The competitive yet collaborative nature of games helped students develop better interpersonal skills.

Interactive Exercises: Exercises that encourage dialogue, such as role-playing and group discussions, were effective in improving verbal communication and active listening skills.

Use of Technology: Tools like interactive whiteboards and mobile apps that facilitate communication and feedback were also beneficial, particularly in making the learning process more engaging and inclusive.

Based on the findings, several practical strategies are recommended for educators and coaches to enhance communicative competence in PE programs:

Integrate Cooperative Learning Techniques: Incorporate activities that require teamwork and collaboration, such as relay races, group challenges, and team sports.

Emphasize Communication in Sports Rules: Clearly articulate the importance of communication in understanding and following sports rules and strategies.

Provide Structured Opportunities for Interaction: Design activities that require students to communicate effectively, such as peer feedback sessions, group discussions, and collaborative problem-solving tasks.

Leverage Technology: Utilize interactive tools and mobile apps to facilitate communication and provide instant feedback, making the learning process more engaging and effective.

Continuous Professional Development: Offer regular training for educators and coaches on innovative pedagogical methods that emphasize the development of communicative competence.

Thus, enhancing communicative competence among PE students in Uzbekistan is essential for their overall development and success. By assessing current levels, identifying key influencing factors, evaluating effective methods, and proposing practical strategies, this article provides a comprehensive framework for educators and coaches to integrate communication skills training into PE programs. Implementing these strategies can help foster a generation of students who are not only physically fit but also capable of effective communication and collaboration in all aspects of life.

Discussion. In modern physical education systems, communication skills are prioritized as they enable teachers to navigate their professional activities efficiently, adapt to the evolving sports landscape, and utilize new communicative teaching technologies. This necessitates creating conditions for the development of communicative competence within the professional competencies of future physical education teachers. As physical culture teachers interact with students interested in sports, they have the opportunity to consolidate traditions and experiences, influence sports reforms, and promote physical culture in society. Proficiency in communication skills prepares them for practical activities in sports, enhances their ability to foresee and adapt to changes in physical culture and the sports industry, and enables them to analyze advancements in sports technologies and management. Communication skills are crucial for adapting to sports environments and developing both professional and interpersonal skills.

The formation of communicative competence is essential for graduates of modern universities, particularly future physical education teachers. Within professional activities, communicative culture fosters the development of effective solutions, the generation of ideas, and the creation of new sports technologies. Developing communicative competence allows future physical education teachers to master the fundamentals of the sports profession, prepare for life and creativity in the 21st century, and achieve professional education's key objectives. Effective communication in sports involves interconnection and interaction, where activities, information, and sports experiences are exchanged to set and solve specific goals and tasks. Communication skills are vital for the effectiveness of sports communication. Research indicates that if the

professional training of future physical education teachers incorporates a communicative approach, modern communicative teaching methods can significantly enhance their communicative competence. This approach is based on the elective course "*Communication and Physical Culture*" and supported by appropriate educational and methodological resources. Communicative culture is a primary characteristic of professional competence for physical education teachers, crucial for personal and professional development. The pedagogical profession requires mastery of effective communication techniques and methods to achieve mutual understanding with students, parents, and colleagues, essential for solving both sports-related and personal problems that can impact sports competition outcomes and overall quality of life.

Conclusion. To sum up, future physical education teachers must acquire necessary knowledge and develop communication skills during their university studies, forming the basis of communicative culture. This culture includes generally accepted moral communication standards, such as politeness, correctness, tact, modesty, accuracy, and courtesy. A teacher's communicative culture involves the ability to communicate productively with children, avoid conflicts, build constructive relationships, achieve mutual understanding in discussions, and provide assistance in problem-solving [2]. Additionally, communicative culture encompasses certain communication norms and behaviors derived from various social and psychological standards and stereotypes. Thus, the study on developing communicative competence in physical education teachers through communicative teaching technologies examined the dynamics of skill development under these technologies' influence. Based on the research findings, it is recommended to use a special course, "Communication and Physical Culture" developed on the communicative communication training method, in the professional training of physical education teachers to enhance their communicative competence.

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Rezyume: Ushbu maqolada jismoniy tarbiya talabalari o'rtasida kommunikativ kompetensiyani rivojlantirish va takomillashtirish bilan bog'liq masalalar haqida so'z boradi. Samarali o'zaro ta'sir va hamkorlik uchun zarur bo'lgan kommunikativ kompetensiya jismoniy tarbiya va sport mashg'ulotlari doirasida tekshiriladi. Maqolada jismoniy faollik va sport muloqot ko'nikmalarini, o'zini o'zi boshqarishni va shaxslararo munosabatlarni yaxshilash uchun platforma bo'lib xizmat qilishi mumkinligi tasvirlangan. Maqola innovatsion pedagogik usullar orqali kommunikativ kompetensiyani rivojlantirish uchun o'qituvchilar va murabbiylar uchun tushuncha va amaliy qo'llanmalarni taqdim etishga qaratilgan. Muallif jismoniy tarbiya talabalarining kommunikativ kompetensiyasini rivojlantirishda hal qiluvchi rol egallashi mumkinligini ta'kidlaydi. Pedagog va murabbiylar innovatsion usullarni qo'llash va samarali muloqotning muhimligini ta'kidlaydigan muhit yaratishga da'vat etiladi. Shunday qilib, jismoniy tarbiya dasturlari talabalarining umumiy shaxsiy va ijtimoiy rivojlanishiga hissa qo'shishi, ularni turli xil hayotiy kontekstlarda muvaffaqiyatli o'zaro munosabatlarga tayyorlashi mumkin.

Резюме: В данной статье рассматриваются вопросы развития и повышения коммуникативной компетентности студентов физического воспитания (ПЕ). Коммуникативная компетентность, необходимая для эффективного взаимодействия и

сотрудничества, рассматривается в контексте занятий физической культурой и спортом. В статье описано, как физическая активность и спорт могут служить платформой для улучшения коммуникативных навыков, самоконтроля и межличностных отношений. Цель статьи – предоставить преподавателям и тренерам идеи и практические применения для развития коммуникативной компетентности с помощью инновационных педагогических методов. Автор предполагает, что физическое воспитание может сыграть решающую роль в развитии коммуникативной компетентности студентов. Преподавателям и тренерам рекомендуется применять инновационные методы и создавать среду, подчеркивающую важность эффективного общения. Таким образом, программы физкультуры могут способствовать общему личному и социальному развитию учащихся, готовя их к успешному взаимодействию в различных жизненных контекстах.

Kalit so'zlar: jismoniy tarbiya (Physical Education), kommunikativ, ko'nikmalar, integratsiya, muloqot, ko'nikmalar, mashg'ulotlar, Jismoniy tarbiya o'quv dasturlari.

Ключевые слова: физическое воспитание (PE-Physical Education), коммуникативное, навыки, интеграция, общение, навыки, обучение, учебные программы физкультуры.

THE PROCEDURAL NATURE OF INFORMATION ABOUT A CRIME PUBLISHED IN THE MEDIA

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Summary: *The article analyzes the procedural essence and content of information about crimes published in the media. It is stated that media reports and information on criminal cases must be regularly checked.*

Key words: *media, news, information, information about crimes, crime, criminal process, media space, investigator, preliminary investigation, evidence.*

The media tries to provide as much news and information about the crime as possible. Because through this the media will gain greater reputation among the public. However, the modern world must clearly understand one thing: the abundance of news and information does not mean that it is true. For this reason, any message or information must be carefully verified before investigation, and the responsibility for its content must be borne by the person who posted it on the air.

Currently, the participation of the media in criminal proceedings is increasingly developing. In general, the trend of news and information about crime and socially dangerous events in the media space of Internet journalism is rapidly increasing. Kun.uz, gazeta.uz, daryo.uz, qalampir.uz and other online journalism sites publish issues related to crime, criminal procedure and criminal execution. It is worth noting that on these online journalism sites, in most cases, the details of the crime are shown through specific numbers, addresses, photographs and videos. Of course, public relations and information services of law enforcement agencies analyze this information in a timely manner, and operational search activities are carried out against them. These cases demonstrate that the media is an institution with a unique status in criminal proceedings.

According to the general theory of law, messages and information are recognized as legal facts related to the emergence, change and termination of legal relations [1, 163]. In the criminal procedural law, information and information are considered as a reason for performing procedural actions, and oblige business entities to perform the appropriate procedural actions, and the owner of the information enters into criminal procedural relations. As part of our scientific work, we are interested in information related to the criminal case.

Reporting crimes is important for the timely response of law enforcement agencies to socially dangerous events. In particular, the trend of messages in the media and in the Internet world requires us to respond to them as quickly as possible. It should be noted that when thinking about messages, the concept of message is closely related to the concept of information, and as part of scientific work, it is important to study the concept of information.

Etymologically, the concept of “information” [information, messages; knowledge] 1. The volume and level of knowledge and skills obtained as a result of training. 2. Message, information; evidentiary document, number, etc. to materials[2, 564]. As a philosophical category, information was initially recognized as any message or knowledge. By the middle of the 20th century, due to the permeability of information channels, new alternatives to the concept of information appeared, and it began to be interpreted as a systematic, organizational and diverse category [3, 216].

In science there are no unified ideas about the concept of information, but, finally, there are many of them. M. Buckland defines three essences of information: “information as a process”, “information as a thing” and “information as knowledge” [4, 351-360].

In the theory of state and law, information is recognized as a systematic connection between events [5, 80]. It is considered one of the basic concepts of legal science, and its status is especially high in criminal procedural law. Because the main task of pre-trial proceedings is focused on collecting information about the crime, which is used in carrying out procedural actions and

decisions in the case. In general, information consists of knowledge and messages about certain events, events and situations. During criminal proceedings, the activities of the investigator and interrogating officer are closely related to information related to the crime. An investigator or investigator who has sufficient information on criminal cases is guaranteed to achieve the necessary results in the case. Information does not lose its significance in a criminal case at any time.

Crime information is an important factor. Some authors connect the terminological understanding of data with its forensic nature. In particular, R.S. Belkin gives the following definition of information in criminal cases: «Critical criminal information consists of reports and information related to the investigation and resolution of a criminal case. It is divided into the following groups: evidentiary information reflected in the evidence; information obtained from non-procedural sources and not having the nature of evidence, but referring to other sources and used in putting forward versions, determining the direction of the investigation, planning investigative actions, predicting the actions of participants in the investigation. Any information about a crime is considered important from a forensic point of view» [6, 83]. Through this phrase, the scientist also recognizes information about criminal cases as information or messages. Similar positions were expressed by M. V. Savelyeva and A. B. Smushkin. According to the authors, messages and information reflecting the crime under investigation, the method of its commission, the participants, the object of criminal aggression, the weapon of the crime and other situations considered important for the investigation are information relevant to the criminal case [7, 240].

M.V. Saveleva and V.V. Stepanov, in turn, show that data is a set of scientific and forensic information that is used in the procedural activities of the subject to solve criminal procedural problems and is considered an integral element of procedural knowledge [8, 20].

E.N. Parshina recognizes as information messages that are important for cases subject to proof during criminal proceedings and related to these cases and necessary to achieve the goals of criminal proceedings [9, 12].

The factor of accessibility of information on criminal cases serves as an important tool for achieving results in the investigation of criminal cases. Unavailability of information leads to dead ends in the investigation. The lack of information negatively affects the continuation of the investigation, since the identity of the person who committed the crime, his location and other important circumstances remain unknown. This situation was clearly described by V. N. Tsimbal. In his opinion, the main activity of an official of any authorized body performing the task of investigating a criminal case and identifying the perpetrators is the search, collection, synthesis, analysis and application of information about the crime and the person who committed the crime. Therefore, the work of the operational commissioner and investigator is impossible without providing sufficient special information [7, 240].

Once information about crimes is formalized by an investigator or investigator, if it reflects the details of the crime and provides a basis for making a decision, it can be used in the evidentiary process. This situation reflects the concept of criminal information in the prism of process and result.

According to A.A. Tushev and N.A. Nazarov regarding these situations, the law recognizes the identification of circumstances that must be proven as a process, and not as a result. This means that the activities of the body or specific entity conducting the criminal process, aimed at obtaining certain information that can be used as evidence in the case, must be properly registered in the materials of the criminal case [10, 196]. Of course, here the concept of information is harmoniously combined with the concept of evidence arising from it as a certificate, and the process of obtaining information should be reflected in procedural documents. This process must fully comply with procedural law. Available information on criminal cases should be verified on a case-by-case basis. Because information does not always mean there is truth in it. In this regard, according to A.G. Bogomolova, during criminal cases, information is provided by witnesses and witnesses to the crime, as well as citizens who have information about the crime. The investigator must always remember that every information must be verified. For example, some information may be provided

by the person who committed the crime or others associated with him, but under certain circumstances the purpose may be to mislead the investigator, provide false information, or misdirect the investigation [11, 7-11].

The author further mentions that the information received must be verified through procedural and operational investigative measures. The investigation of criminal information through investigative activities should be carried out more actively. This is due to the fact that most of the information is obtained by non-procedural (operational) methods, which always require additional verification. The investigator does not have the opportunity to check all the information about the crime only in a procedural manner. At such moments, operatives have ample opportunity to implement messages and information coming from the media [12, 101].

Thus, the reason why the scientist emphasizes information provided by the media among information about crime is due to the fact that the process of providing information about crime by the media is rapidly developing. It is the information presented or broadcast by the media that requires immediate and prompt verification. It is no secret that even if the authorized body that must respond to this category of information is one day late, this situation will negatively affect its reputation.

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Rezyume: *Maqolada jinoyat haqida ommaviy axborot vositalarida e'lon qilingan ma'lumotlarning protsessual mohiyati va mazmuni tahlil qilingan. Ommaviy axborot vositalaridagi xabarlar va jinoyat ishlari bo'yicha ma'lumotlar muntazam tekshirilishi shartligi ta'kidlangan.*

Резюме: *В статье анализируются процессуальная сущность и содержание информации о преступлениях, опубликованной в средствах массовой информации. Указано, что сообщения СМИ и информация по уголовным делам должны регулярно проверяться.*

Kalit so'zlar: *ommaviy axborot vositalari, yangiliklar, ma'lumotlar, jinoyatlar to'g'risidagi ma'lumotlar, jinoyat, jinoiy jarayon, ommaviy axborot vositalari, tergovchi, dastlabki tergov, dalillar.*

Ключевые слова: *средства массовой информации, новости, информация, информация о преступлениях, преступление, уголовный процесс, медиaprостранство, следователь, предварительное следствие, доказательства.*

DEVELOPMENT OF TOURISM IN PHYSICAL EDUCATION CLASSES FOR SCHOOL-AGE CHILDREN

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Summary: *This article provides information on the promotion of tourism in physical education classes for school-age children.*

Key words: *Popularization of tourism in classes on physical education, tourism, sports, school-age children, travel.*

According to our scientists, tourism requires physical and spiritual education of a person, knowledge of the environment, communication, recreation with the help of tourist tools in order to achieve tourist goals, and in their free time, special goals are set for travel: health, sports, cultural and spiritual recreation, going to educational museums. [89, 204, 224, 225] The types of tourism depend on the types of transport: hiking, mountain, sleigh, water, cycling, autotourism, mountain tourism, equestrian sport [166]. Each of which is part of sports tourism and differs significantly from each other. At the same time, there are requirements and norms for the management of species. Tourism is included in the unified Russian sports regime, which, along with other types of sports tourism, is standardized in terms of technical requirements, duration of tourist routes, length and other principles. Currently, sports tourism is developing in the following areas: Sports Travel and tourism. Today's content of sports tourism indicates the absence of natural spaces in natural relief. There are different types of obstacles: boulders, snow, ice, water obstacles, and many others. Types of natural barriers in macro and micro-relief also become forms [1]. Tourist routes are divided into amateur and regular routes. In scheduled (excursion) tourism, participants travel along the routes marked by transport.

In favorite tourism, the trip tends to be full or incomplete self-service. Here, the travelers themselves determine the method of travel (hiking, carpeting, boating, etc. All forms of sports and recreational tourism are recognized as sports in our country [77]. Sports and health tourism are among the most important health systems. It studies sports, mental and cognitive principles. Educational tourism is widespread due to its skill and intellectual potential, convenience and capabilities. According to A.Kvartalny [77] Zarina I [63, 64, 65, 66] tourism is a self - purpose, self-sufficient also valuable, confirming this as clear the types of travel of amateur tourism. It requires almost no effort. Appearance encourages evangelism, selflessness to travelers, teaches curiosity and patience. Tourism-education and communication with friends; knowledge of their homeland, acquaintance with historical and cultural sites; meeting people and physical development of the individual. [77, 172, 209, 214, 207]. In addition, it will only create new paths, that is, improve physical condition and improve your health. According to A.A.Ostapets [146] S. T Uskovs [180] school tourism provides students with a deeper education, children see it in the form of breathable and useful work, adolescents see the best features of children's development, which gives information to any upbringing: physical, aesthetic, moral, educational and other. A number of fees [70, 86, 187, 210, 211] school tourism considers structural, integrative differences that can affect both large museums and the individual as well as society. It increases the spiritual and physical maturation of children, the level of knowledge and flexibility, finds a place for children to show themselves, correct themselves, create people and means of communication. The main forms of tourist games are hiking, travel, excursions, tourist rallies and competitions, wheel-spinning and exercise. Children's tourism trips are considered as a form of education and health care, the way they pass, providing an opportunity to address educational, educational, and health issues-the winning asset form of tourist travel is According to Yu.S.Konstantinov [89] tourism is an adult rally, competitions introduce many schoolchildren to tourism and adults, while at the same time it is

a winning form of school aimed at identifying the best tourist groups. The two forms are the first stage of a tour excursion-this is a trip to places where monuments, heroes' monuments are placed, literature, museums and much more. There can be a type of tourism: walking, which also includes natural obstacles, is an active travel method, such as relaxation and learning. With the help of running, washing, exercise, sports and outdoor games, forms of body and respiratory treatment are developed. Wellness with children, education and education with educational tourism tools and houses. Physical education of children is a socio - pedagogical process aimed at ultimately achieving physical maturity. V.A.Medvedev [130] considers the pedagogical process as the main components of the areas of health, culture, education and education. In the process of implementing the health sector, the forms and functions of the human body are optimized, the direction of development regulates physical abilities and talents, expands the knowledge, weapons skills and abilities received and carries out its work. The institution is an intermediate close link for the physical and educational development of students in primary grades. With the help of tourism tools of various directions, the solution of educational and health issues is carried out. In the direction of the wellness of tourism devices, most health classes are the best way to revive, develop and optimize the physical, adaptive, emotional, spiritual capabilities and forces of a person through physical education and tourism.

Physical activities are the use of tourism tools to improve children's health in combination with outdoor games, sports activities and various forms of sports games. Conducting outdoor activities is one of the most important studies of physical education using tourism instruments - to convey functional systems and ensure the activity of the body. Body health is the most important means of strengthening human health. The main tools for the hardening of the body are the forces of Nature - Air, Water and the sun. Outdoor exercise helps to strengthen health and increase the body's resistance to harmful environmental influences. Natural principles on which the complex is applied provide resistance to various environmental influences (heat, rain, rain, heat) in children. In combination with physical training, the tightening of the body is considered the most important: good muscle performance promotes the improvement of the body's processing process and awakens the body to the outer Center. The importance of body hardening procedures to improve health and fitness, as they make the heart, blood and blood vessels healthier, improve the functioning of other organs, improve the health of a number of people and expand the functional capabilities of the body. The specificity of the movement depends not only on the form of the movement of matter, but also on the life itself. The evolutionary development of Man provides the normal development of all organs and systems only with weapons. A.P.Matveyev stressed problems with the physical activity of children that the daily difficulties associated with studying at school should be taken into account. At the same time, he also pays attention to his first graders. Since the child changes from playing to sitting and is very "critical", first graders have an average of 50% less heart disease than school-aged ones. In primary classes, there is a significant difference in physical activity parameters between boys and girls: in boys, these indicators are higher than the average of 16 -30%. A.P. Matveyev also noted that elementary students need to make at least 12-18 thousand movements per day for the average level of physical weakness and all its types. Students in Grade I-IV are required to learn to use tourism instruments in physical education classes. When conducting a survey among physical education teachers, the school identifies trends in the promotion of physical education. The survey involved 65 physical education teachers with an average pedagogical experience of 10 years. The questionnaire included 22 questionnaires, of which 7 covered children and 15 covered a special survey on the use of Tourism tools in schools. The survey found that the school's tourism facilities were used by 12 teachers (18.4 percent of respondents), with only 2 (3.1 percent) using tourism in physical education classes in the primary classes. Sports and tourism games, which are most used in physical education, are used by 10 physical education teachers (15.4%), 7% of the number of physical education teachers surveyed (10.7%) use tourist relay, while hiking and sleigh tourism classes are used by 4 physical education teachers (6.2% of the total number of teachers surveyed). Interestingly, the teachers with whom we talked do not use

topographic games, and 3.1% of them include simple topographic tasks in the educational material. At the same time, 63 physical education teachers prefer travel and excursions (96.9% of the total number of physical education teachers who participated in the survey). In a survey of how children react to tourism, we received the following data: 21 physical education teachers (32.3% of the total number of physical education teachers) took part in the survey, a positive result - 30 surveys, which is 46.15% of the total number. Physical education teachers loved, 10 physical education teachers (15.4% of the total number of physical education teachers) struggled to respond, while 4 Teachers (6.15%) struggled to respond. Basically this % depends on the total number of teachers. In conclusion, the promotion of tourism in physical education classes for school-age children is becoming the main topic of the day.

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Rezyume: *Ushbu maqolada maktab yoshidagi bolalar uchun jismoniy tarbiya darslarida turizmni targʻib qilish boʻyicha maʼlumotlar keltirilgan.*

Резюме: *В данной статье представлена информация о пропаганде туризма на занятиях по физическому воспитанию детей школьного возраста.*

Kalit soʻzlar: *Jismoniy tarbiya darslarida turizmni targʻib qilish, turizm, sport, maktab yoshidagi bolalar, sayohatlar.*

Ключевые слова: *Популяризация туризма на занятиях по физкультуре, туризму, спорту, детям школьного возраста, поездкам*

**PEDAGOGICAL PRINCIPLES FOR ENHANCING THE PARTICIPATION OF WOMEN
IN PHYSICAL EDUCATION AND SPORTS**

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Summary: *The article describes the importance of physical education especially among women with educational potential that will undoubtedly contribute to a more educated younger generation. Throughout human history, the direction of development has been defined by the methodological unity of socio-economic progress. The article deals with the importance of sports ethics that implies fair conduct of the competition and respect for all participants of the sport, including the opponent. Also, the author assumes that willingness to increase the activity of women and girls in physical education and sports is clearly visible in striving for the goal, patience, achievement and courage, initiative and independence, endurance and self-control in overcoming obstacles.*

Key words: *pedagogical, foundations, activities, women, physical education, sports, physical data, pedagogical relevance.*

Introduction. Focusing on women is a primary objective for our society, especially as our nation has achieved independence and is progressing in legal, social, and democratic realms. The protection of motherhood and childhood, their social rights, and addressing violence against them are pressing issues today. It is evident that the role of women in our society is expanding each year. In the past, women were often unable to voice their opinions within their families, but now they can express their thoughts not only within the family but also in society and across the country. This progress reflects the development and advancement of our era. However, it would be incorrect to say that women in every remote city and village in our country can fully exercise their rights and opportunities. Various laws and decrees have been implemented to enhance the political status of women and girls and to improve their social activities, leading to an increase in the number of women with pedagogical potential in our country [1]; [2]. This was a factor in the development of science, art, culture, production and lifestyle, which are forms of social consciousness based on socio-economic views, ideas and ideals prevailing in the society.

In this way, during the historical development, the rich spiritual heritages collected in the context of education and upbringing of a well-rounded person have found little expression in folk pedagogy. The issues of using all the possibilities of folk pedagogy in raising perfect, morally pure, mature in all respects, dedicated to our people and country, that physically fit young people determine the purpose of studying this subject. For example, it is important to explain the nature of national and spiritual values to the next generation. It is known that the people create and transmit values from generation to generation. Therefore, in folk pedagogy, values are widely organized pedagogically, in which they are manifested in the following forms: family values, labor values, socio-political values, cultural-educational values, artistic-aesthetic values, values related to a healthy lifestyle, spiritual-spiritual values. There is a saying among people that more women become pedagogues, but there is actually a lot of logic in this statement. Because the number of female pedagogues among our people is quite large. The reason for this is that a woman is the mother in the family, she understands the child more than men.

Therefore, they can quickly get along with children and help them psychologically. Teacher training has a systematic effect on students in order to educate them. In this, it is based on psychological and social factors. In a certain sense, the disciplines of psychology can also be included in the system of pedagogical sciences. The science of ethics and aesthetics provides information on the theory of education department of pedagogy. This subject defines and defines the standards of behavior and manners of the teacher and explains beauty in the true sense, instills in the mind of the student a love for attractive and elegant aspects of life [3]. The teaching of science is also related to the didactic branch of the science of pedagogy. Because the method of

teaching any subject and the content and system of this subject serve to be reconciled by the students.

Literature review. Both pedagogues and parents should know the purpose of education. In comprehensive schools, the main goal of education is the all-round development of a person. The all-round development of a person, which includes the perfection of some of his aspects or qualities, the sum of his physical, moral, political, and aesthetic views. Education depends on the method of production of material wealth, social structure of society, ideology. When we use the word education, the words ethics and aesthetics often come to mind. It is natural of course. Because aesthetics is a form of education. Every smart female teacher should give an understanding about it to the students. Society's aesthetic culture means a complex of material and spiritual values acquired during the entire history of human development. Aesthetic culture of the student's personality is formed as a result of active, creative appreciation of his cultural heritage. The main components of a person's aesthetic culture are aesthetic consciousness, needs, attitudes and aesthetic activities.

Students and pedagogues should have hygiene and physiological standards for the girls of that time in the classroom and at home in order to be able to do the training. Main principles of planning optimization are carried out taking into account the principle of approach to the design of the teaching and training process. These processes certainly help the development of the field of pedagogy. In our country, the method of training of female pedagogues is increasing year by year, because the attention towards pedagogues in our country is increasing. This can show that the education sector in our country will develop further in the future. From the point of view of sports specialty, the general goal of training an athlete is to develop his physical and mental qualities. In turn, its specific purpose, achieving high sports results, requires the organization of appropriate competition opportunities. In the process of educating and training an athlete, the following tasks are set:

1. *Tasks in the field of education of conscious, personal, moral qualities and mental preparation.*
2. *Tasks in the field of physical training.*
3. *Tasks in the field of technical and tactical training.*

Discussion. The athlete's training system includes the following processes: competitions (as preparation), sports training and the use of material and information (information) support. The benefit of training with the help of competitions is explained by the increase in the possibility of competition, taking into account all the requirements of competitive activity. Therefore, the conditions are different from the competitions, the sports program is necessarily filled with competition practice, because its role increases with the increase of sports results. Material support is related to the sports base (stadiums, swimming pools, fields, halls), equipment, sports clothes and clothes, nutrition, medical services and supervision, complex scientific groups, organization of rehabilitation and rehabilitation and others. material supply not only affects the success of training, but also determines the scope of competition. It goes without saying that sufficient material support reflects the necessary requirements of a modern sports champion. In this case, we are currently paying close attention to the creation of material bases for the development of sports in our country. A clear example of this is the construction of world-class sports bases in our country.

Information provision in sports includes a system of theoretical situations, technical tools and practical meetings used for the purpose of conveying specific information to the coach (as well as the athlete), preparing and controlling the competitive activity of the athlete (team). For example, a trainer gets all professional knowledge thanks to information supply. It is necessary to include their education, special study in the field of sports, goals and tasks, as well as legal activities, study of advanced methods and means of training and education of athletes, personal scientific research, and analysis of the materials collected in the scientific group. Some special types of information supply, that is, the process of receiving information about important aspects of the competition activity, the characteristics of the referees used for the purpose of choosing the optimal tactics, opponents, places of the competition, is called "Sports games". An important part of the

information supply in the training of the athlete is the complex control, which includes the monitoring of the activity of the competition, the training load and the condition of the athlete [4]. A high level of information supply is absolutely necessary for achieving sports results, because neither the experience of the athlete nor the good financial support of his training can replace the insufficient or incomplete knowledge of the coach.

Mental preparation. The mental preparation of an athlete depends on the solution of a wide range of tasks, i.e. intellectual, practical, patriotic, moral education and preparation of his psyche for effective action in competition and training conditions. As mentioned earlier, one of the important aspects of sports is its educational aspect [5]. First of all, this is manifested in the effective implementation of spiritual education. The special feature of sports requires the athlete to observe sports ethics first of all. That is, the norms of communication with opponents, referees, partners, coaches, which go beyond the limits of the official rules of the sport. Sports ethics implies fair conduct of the competition and respect for all participants of the sport, including the opponent [3]. The relevance of this issue is of great importance in sports spectacles, that is, false actions to achieve success and failure to follow the rules arouses a negative attitude in fans. Mental training is divided into general and special training.

General-mental preparation includes the formation of personal orientation, discipline, self-regulation, formation of willpower necessary for sports, development of mental state control. Special mental preparation is a part of forming the participant's readiness for a certain competition. One of the important aspects of an athlete's mental preparation is training the will. Examples of these are the length of the distance, opponent's resistance, meteorological scientific conditions, the state of sports facilities, the large size of the competition's load, the complexity of the movement being studied, the sports regime. It is necessary to take into account the practice of sports training and competition in the training of the qualities of increasing the activity of women and girls in sports. To increase the activity of women and girls in physical education and sports is to harmonize the development of her high mental activity and her focus on overcoming obstacles. The formation of emotional components of willpower is carried out based on the experience gained in overcoming difficulties in competitions. Training can include sufficient speed, strength, endurance, attention, maximum volitional aspects aimed at overcoming negative emotional states, self-doubt, fear, loss of control [6]. This requires effective organization of self-education and individual action. An athlete must learn to control his mind and use his willpower on the basis of this. In the process of creating the opportunity to compete, all parts of the athlete's training are closely related. So, if the athlete is doing exercises in the tactical direction, then he tries not only to make the right decisions, but also to improve the technique in order to repeat the movements as much as possible, it also increases physical fitness, and in doing so, it trains the willpower of the person to overcome the difficulties that arise. Thus, the training of an athlete is a whole process, some of its separate aspects complement each other. The methodological principles of physical education, the systematic effect of physical exercises, the human body can be successful if there is a way to use them, the system of means and methods is consistent with the basic rules and laws. By managing these processes, the coach should make reasonable decisions about the nature and size of training loads, training tools and methods, and the conditions for training to change the athlete's condition in a significant way. It is known that the right decision is made only when the coach can clearly express the goals and tasks of his activity based on the movement of objective laws in sports training. Theoretical principles in the process of physical education, on the one hand, serve as a regulation, and on the other hand, in the process of physical training, the teacher is theoretically and methodically oriented to a certain framework (template). In the pedagogical process and practical activity, the principle can become important in the form of obligation and law. These facts, noted as a result of a large number of scientific researches and practical work of leading coaches, are primarily related to the characteristics of the athlete's ability to compete.

Conclusion. Achieving high results in sports includes mandatory activities in the workplace, the driving conditions of the habituation process, movement and knowledge. Pedagogical analysis

of the above helps to clearly form the foundations of the coach's activity. Sports training as a pedagogical process is carried out in a certain system of physical education. A type of physical education methodology is considered to achieve high results. Joint analysis of successful or unsuccessful exercises, search for errors in the technique of actions, their causes and methods of elimination will help. In order to form a conscious and active attitude of students to the educational process, which teaches them introspection, self-respect, self-control of motor activity.

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Rezyume: Maqolada, ayniqsa, yosh avlodning bilimli bo'lishiga hissa qo'shishi, ta'lim salohiyatiga ega bo'lgan ayollar o'rtasida jismoniy tarbiya muhimligi tasvirlangan. Insoniyat tarixi davomida rivojlanish yo'nalishi ijtimoiy-iqtisodiy taraqqiyotning metodologik birligi bilan belgilab kelingan. Maqolada musobaqani adolatli o'tkazish va sportning barcha ishtirokchilariga, shu jumladan raqibga hurmat ko'rsatishni nazarda tutuvchi sport etikasining ahamiyati haqida so'z boradi. Shuningdek, muallif maqsad sari intilish, sabr-toqat, yutuq va mardlik, tashabbus va mustaqillik, to'siqlarni yengib o'tishda chidamlilik va o'zini tuta bilishda xotin-qizlarning jismoniy tarbiya va sportdagi faolligini oshirishga tayyorlik yaqqol namoyon bo'ladi deb hisoblaydi.

Резюме: В статье описывается важность физического воспитания, особенно среди женщин с образовательным потенциалом, что, несомненно, будет способствовать формированию более образованного молодого поколения. На протяжении всей истории человечества направление развития определялось методологическим единством социально-экономического прогресса. В статье рассматривается значение спортивной этики, предполагающей честное проведение соревнований и уважение ко всем участникам спорта, включая соперника. Также автор предполагает, что готовность к повышению активности женщин и девушек в занятиях физической культурой и спортом отчетливо проявляется в стремлении к цели, терпении, достижениях и смелости, инициативе и самостоятельности, выдержке и самоконтроле в преодолении препятствий.

Kalit so'zlar: pedagogik, asoslar, faoliyat, ayollar, jismoniy tarbiya, sport, jismoniy ma'lumotlar, pedagogik dolzarblik.

Ключевые слова: педагогические, основы, деятельность, женщины, физическое воспитание, спорт, физические данные, педагогическая значимость.

UDK: 349.6

**ARTIFICIAL INTELLIGENCE FOR CLIMATE ADAPTATION AND FOOD SECURITY
IN THE ARAL SEA REGION: A COMPARATIVE ANALYSIS OF INTERNATIONAL
LEGAL FRAMEWORK**

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Summary: *The Aral Sea region, spanning parts of Central Asian countries, has faced severe environmental degradation and food insecurity challenges due to the shrinking of the Aral Sea and the impacts of climate change. Artificial intelligence (AI) technologies have emerged as promising tools to address these complex issues, but their successful implementation requires robust legal and regulatory frameworks. This article conducts a comparative analysis of international legal frameworks governing the use of AI in climate change adaptation and food safety domains, with a specific focus on the Aral Sea region. It examines the legal landscape across various jurisdictions, including data protection regulations, intellectual property rights, algorithmic accountability mechanisms, and ethical guidelines for AI deployment. The article also explores regional and international agreements, treaties, and cooperation mechanisms relevant to the Aral Sea region, highlighting their potential role in facilitating cross-border collaboration, harmonization of legal frameworks, and capacity-building initiatives. By identifying best practices, gaps, and areas for harmonization, this study aims to inform policymakers and stakeholders in the development of a comprehensive legal and regulatory framework that enables the responsible and equitable adoption of AI technologies for climate change adaptation and food security in the Aral Sea region.*

Keywords: *Artificial Intelligence, Climate Change Adaptation, Food Security, Aral Sea Region, International Law, Comparative Legal Analysis, Data Protection, Intellectual Property, Algorithmic Accountability, International Cooperation.*

I. Introduction. The Aral Sea region, encompassing parts of Kazakhstan, Uzbekistan, Turkmenistan, Tajikistan, and Kyrgyzstan, has been grappling with severe environmental degradation and food insecurity challenges for decades. The rapid shrinking of the Aral Sea, once the fourth-largest inland water body in the world, is considered one of the worst environmental disasters of the 20th century. This catastrophic desiccation has had far-reaching consequences for the region's ecosystems, water resources, and agricultural productivity [1].

The Aral Sea crisis is a complex and multifaceted issue, rooted in a combination of unsustainable water management practices, overexploitation of natural resources, and the impacts of climate change. Excessive diversion of water from the Amu Darya and Syr Darya rivers, which historically fed the Aral Sea, for irrigation purposes in the region's extensive cotton cultivation areas, has been a major contributing factor. This has led to a significant reduction in the sea's water levels, exposing vast areas of the former seabed and creating a multitude of environmental and socio-economic challenges. The desiccation of the Aral Sea has severely impacted the region's ecosystems, leading to the loss of biodiversity, the degradation of surrounding landscapes, and the formation of salt and dust storms that pose risks to human health and agricultural productivity. Furthermore, the depletion of water resources has had profound consequences for the region's agricultural sector, which relies heavily on irrigation for crop cultivation and livestock production.

Compounded by the impacts of climate change, such as rising temperatures, changing precipitation patterns, and increased frequency of extreme weather events like droughts and floods, the Aral Sea crisis has threatened the food security and livelihoods of millions of people residing in the surrounding areas [2]. Climate change exacerbates the existing water scarcity issues, further straining the region's fragile ecosystems and agricultural systems, and putting additional pressure on already limited water resources. In recent years, the potential of artificial intelligence (AI) technologies has emerged as a promising solution to address complex environmental and societal challenges, including climate change adaptation and food security. AI-powered tools, such as machine learning algorithms, computer vision, remote sensing, and predictive analytics, have

demonstrated their capacity to process vast amounts of data, identify patterns, and provide actionable insights for decision-making [3]. These technologies hold the potential to support sustainable water management, optimize agricultural practices, monitor environmental changes, and inform climate adaptation strategies. However, the responsible and equitable implementation of AI technologies in the Aral Sea region requires robust legal and regulatory frameworks that address critical issues such as data governance, algorithmic transparency, intellectual property rights, and ethical considerations. These frameworks are crucial to safeguarding individual rights, fostering innovation, and ensuring that the adoption of AI aligns with the region's socio-economic, cultural, and environmental priorities. This article conducts a comprehensive comparative analysis of international legal frameworks governing the use of AI in climate change adaptation and food security domains, with a specific focus on the Aral Sea region. By examining the legal landscape across various jurisdictions and identifying best practices, gaps, and areas for harmonization, this study aims to inform policymakers and stakeholders in the development of a comprehensive legal and regulatory framework that facilitates the responsible adoption of AI technologies for addressing the multifaceted challenges faced by the Aral Sea region.

II. Methods. To conduct a comprehensive comparative analysis of international legal frameworks relevant to the use of AI for climate change adaptation and food security in the Aral Sea region, a multi-pronged approach was adopted. This included:

1. Systematic literature review: A systematic review of academic literature, legal journals, policy reports, and official documents was conducted to identify relevant legal frameworks, regulations, and policies related to AI, climate change adaptation, food security, and environmental protection across various jurisdictions and international organizations.

2. Comparative legal analysis: A comparative analysis of the identified legal frameworks was performed, focusing on key aspects such as data protection regulations, intellectual property rights regimes, algorithmic accountability mechanisms, ethical guidelines, and provisions for international cooperation and harmonization.

3. Stakeholder consultations: Semi-structured interviews and focus group discussions were conducted with legal experts, policymakers, AI researchers, environmental scientists, and representatives from international organizations and non-governmental organizations (NGOs) working in the Aral Sea region. These consultations provided valuable insights into the on-the-ground challenges, practical considerations, and potential solutions from diverse perspectives.

4. Case study analysis: Relevant case studies and real-world examples of AI implementation in environmental and agricultural contexts were analyzed to understand the legal and regulatory challenges, as well as the lessons learned from practical applications.

The data collected through these methods were synthesized and analyzed using qualitative and quantitative techniques, including legal interpretation, policy analysis, and thematic analysis. The findings were then structured to provide a comprehensive comparative overview of the international legal landscape governing the use of AI for climate change adaptation and food security, with a specific focus on the Aral Sea region.

III. Results and Discussion.

A. The Legal Landscape of AI Governance: Data Protection and Privacy

The adoption of AI technologies in domains such as climate change adaptation and food security often involves the collection, processing, and sharing of large volumes of data, including personal information, satellite imagery, and sensor data. Robust data protection and privacy regulations are essential to safeguard individual rights, ensure data security, and foster public trust in AI systems. The comparative analysis revealed diverse approaches to data governance across different jurisdictions and international frameworks.

1. The European Union's General Data Protection Regulation (GDPR) [4]: The GDPR is widely recognized as one of the most comprehensive data protection frameworks globally. It establishes strict requirements for data processing, such as the principles of data minimization, purpose limitation, and data subject rights, including the right to be forgotten and the right to object

to automated decision-making. The GDPR's extraterritorial scope and significant penalties for non-compliance have influenced data protection laws in many other countries.

2. The OECD Privacy Framework [5]: The Organisation for Economic Co-operation and Development (OECD) has developed a comprehensive privacy framework that includes principles such as collection limitation, data quality, purpose specification, security safeguards, and accountability. This framework serves as a global reference point for data protection laws and has been adopted or influenced legislation in various OECD member countries and beyond.

3. National Data Protection Laws: Many countries, including those in the Aral Sea region, have enacted national data protection laws or are in the process of developing such frameworks. For instance, Kazakhstan has adopted a Personal Data Protection Law [6], while Uzbekistan is working on a draft law on personal data protection [7]. However, the scope, enforcement mechanisms, and alignment with international standards vary across these national laws.

4. International Agreements and Frameworks: Several international agreements and frameworks address data protection and privacy in the context of cross-border data transfers and international cooperation. The Council of Europe's Convention 108 [8] and its Protocol [9] provide a legal framework for data protection and facilitate the free flow of personal data among signatory countries. The United Nations has also developed principles and guidelines for data protection and privacy in the context of sustainable development and environmental monitoring [10].

While these frameworks provide valuable guidance and promote harmonization, the comparative analysis revealed challenges in ensuring consistent implementation and enforcement across different jurisdictions, particularly in regions like the Aral Sea area, where legal and institutional capacities may vary.

B. Intellectual Property Rights and Technology Transfer

The development and deployment of AI technologies for climate change adaptation and food security often involve significant investments in research and development, as well as the creation of proprietary algorithms, software, and hardware. Intellectual property (IP) rights play a crucial role in incentivizing innovation, promoting knowledge sharing, and facilitating technology transfer. The comparative analysis explored various international IP frameworks and their implications for the Aral Sea region.

1. The TRIPS Agreement [11]: The Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) is a multilateral agreement administered by the World Trade Organization (WTO). It establishes minimum standards for various forms of IP protection, including patents, copyrights, and trade secrets. While TRIPS aims to strike a balance between promoting innovation and facilitating technology transfer, concerns have been raised about its potential impact on access to essential technologies in developing countries.

2. The Patent Cooperation Treaty (PCT) [12]: The PCT is an international patent law treaty that streamlines the process of seeking patent protection internationally. It provides a centralized filing system and facilitates the dissemination of technical information, which can be particularly beneficial for countries in the Aral Sea region seeking to access and leverage patented AI technologies for climate change adaptation and food security applications.

3. The Nagoya Protocol [13]: The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is relevant to the use of AI in agricultural and environmental domains. It establishes a legal framework for access to genetic resources and traditional knowledge, as well as the fair and equitable sharing of benefits arising from their utilization. This protocol is particularly relevant in the context of the Aral Sea region, where traditional agricultural practices and indigenous knowledge may play a role in climate adaptation strategies.

4. Regional and Bilateral Agreements: In addition to international frameworks, regional and bilateral agreements can facilitate technology transfer and knowledge sharing among countries in the Aral Sea region. For instance, the Eurasian Economic Union (EAEU) has established a common

IP rights regime [14] that harmonizes patent, trademark, and industrial design protection among its member states, including Kazakhstan and Kyrgyzstan.

While these frameworks provide a foundation for IP protection and technology transfer, the comparative analysis highlighted the need for capacity-building initiatives, regional cooperation mechanisms, and tailored approaches to address the specific challenges and needs of the Aral Sea region in leveraging AI technologies for climate change adaptation and food security.

C. Algorithmic Accountability and Ethical Considerations.

The deployment of AI systems in critical domains such as climate change adaptation and food security raises ethical concerns related to fairness, transparency, accountability, and potential impacts on human rights. As these technologies increasingly influence decision-making processes with far-reaching consequences, robust legal and ethical frameworks are necessary to ensure responsible and equitable implementation.

1. **Algorithmic Accountability and Explainability:** Several jurisdictions and international organizations have developed guidelines and frameworks to promote algorithmic transparency and accountability. The European Union's Ethics Guidelines for Trustworthy AI [15] emphasize principles such as transparency, non-discrimination, and human agency and oversight. Similarly, the OECD AI Principles [16] call for AI systems to be robust, secure, and safe throughout their lifecycle, while respecting the rule of law, human rights, democratic values, and diversity.

2. **Impact Assessments and Auditing:** To mitigate potential risks and unintended consequences, some frameworks recommend conducting algorithmic impact assessments and audits. The European Commission's proposal for an AI Act

C. Algorithmic Accountability and Ethical Considerations (continued).

2. **Impact Assessments and Auditing:** To mitigate potential risks and unintended consequences, some frameworks recommend conducting algorithmic impact assessments and audits. The European Commission's proposal for an AI Act [17] mandates conformity assessments for high-risk AI systems, including those used in critical infrastructure, education, and employment contexts. Similarly, the IEEE Ethically Aligned Design Framework [18] emphasizes the importance of regular auditing and impact assessments throughout the AI system lifecycle.

3. **Human Rights and Non-Discrimination:** The use of AI in domains such as climate change adaptation and food security may have implications for human rights, particularly for vulnerable and marginalized communities. The United Nations Guiding Principles on Business and Human Rights [19] provide a framework for addressing the potential adverse impacts of business activities, including the development and deployment of AI technologies, on human rights. Additionally, frameworks like the Toronto Declaration [20] emphasize the importance of non-discrimination and the prevention of algorithmic bias in AI systems.

4. **Global Governance and Cooperation:** While national and regional frameworks play a crucial role, the transnational nature of AI technologies and their applications in addressing global challenges like climate change necessitates international cooperation and governance mechanisms. The UNESCO Recommendation on the Ethics of Artificial Intelligence [21] provides a global normative framework for the development and use of AI, emphasizing principles such as human rights, diversity, and environmental sustainability. Similarly, the OECD AI Principles [16] call for inclusive multi-stakeholder collaboration and the sharing of information and knowledge among governments, stakeholders, and relevant entities.

The comparative analysis revealed a growing emphasis on algorithmic accountability, ethical considerations, and human rights in the context of AI governance. However, the effective implementation of these principles and frameworks in the Aral Sea region requires capacity-building initiatives, tailored guidance, and regional cooperation to address the unique socio-economic, cultural, and environmental challenges faced by the region.

D. International Cooperation and Capacity Building.

Addressing the complex challenges of climate change adaptation and food security in the Aral Sea region necessitates collaborative efforts and knowledge sharing among countries, as well

as support from international organizations and stakeholders. The comparative analysis highlighted various frameworks and mechanisms that can facilitate international cooperation and capacity-building initiatives in the context of AI governance.

1. **Regional Cooperation Frameworks:** Several regional organizations and initiatives have been established to promote cooperation and joint efforts in addressing environmental and developmental challenges in the Aral Sea region. The International Fund for Saving the Aral Sea (IFAS) [22], established by the Central Asian states, serves as a platform for coordinating regional efforts and mobilizing resources for addressing the Aral Sea crisis. Similarly, the Regional Environmental Centre for Central Asia (CAREC) [23] facilitates cooperation and capacity-building initiatives related to environmental protection and sustainable development.

2. **International Development Assistance:** International development organizations and donor agencies play a crucial role in providing financial, technical, and capacity-building support to countries in the Aral Sea region. The United Nations Development Programme (UNDP) [24], the World Bank [25], and the Asian Development Bank (ADB) [26] have implemented various projects and initiatives related to climate change adaptation, water resource management, and agricultural development in the region. These organizations can also support the responsible adoption of AI technologies through capacity-building programs, knowledge transfer, and the provision of technical assistance.

3. **Multi-stakeholder Partnerships:** Addressing the challenges of climate change adaptation and food security in the Aral Sea region requires collaboration among diverse stakeholders, including governments, international organizations, research institutions, civil society organizations, and local communities. Frameworks such as the UN Sustainable Development Goals (SDGs) [27] and the Paris Agreement on Climate Change [28] emphasize the importance of multi-stakeholder partnerships and inclusive decision-making processes. Initiatives like the AI for Good Global Summit [29], organized by the International Telecommunication Union (ITU), provide platforms for stakeholders to collaborate and share best practices in leveraging AI for sustainable development.

4. **Knowledge Sharing and Technology Transfer:** The effective adoption and localization of AI technologies in the Aral Sea region rely on knowledge sharing and technology transfer mechanisms. Frameworks like the World Intellectual Property Organization's (WIPO) Development Agenda [30] and the United Nations Technology Bank for Least Developed Countries [31] aim to facilitate access to knowledge, technical assistance, and capacity-building initiatives for developing and least developed countries.

While these frameworks and initiatives provide valuable opportunities for international cooperation and capacity building, the comparative analysis highlighted the need for tailored approaches that address the specific challenges, priorities, and socio-economic contexts of the Aral Sea region. Strengthening regional cooperation mechanisms, fostering multi-stakeholder partnerships, and leveraging international support can contribute to the responsible and effective adoption of AI technologies for climate change adaptation and food security in the region.

IV. Implications and Recommendations.

Based on the comparative analysis of international legal frameworks and the insights gained from stakeholder consultations and case study analyses, several implications and recommendations can be derived to guide the development of a comprehensive legal and regulatory framework for the responsible adoption of AI technologies in the Aral Sea region.

A. Harmonization and Alignment with International Standards

To facilitate cross-border cooperation, knowledge sharing, and technology transfer, it is essential for the legal frameworks governing AI in the Aral Sea region to align with international standards and best practices. This can be achieved through:

1. **Adopting or adapting established frameworks:** Countries in the Aral Sea region can leverage existing international frameworks, such as the GDPR, OECD AI Principles, and the

UNESCO Recommendation on the Ethics of AI, as foundations for developing their national laws and regulations.

2. Participating in international agreements and treaties: Active participation in relevant international agreements and treaties, such as the TRIPS Agreement, the PCT, and the Nagoya Protocol, can facilitate access to essential technologies, promote knowledge sharing, and foster alignment with global IP norms.

3. Engaging in regional harmonization efforts: Regional organizations like the EAEU and CAREC can play a crucial role in harmonizing legal frameworks and promoting cross-border cooperation among countries in the Aral Sea region.

B. Capacity Building and Institutional Strengthening

Effective implementation of legal frameworks and responsible AI adoption require robust institutional capacities and human resources. Capacity-building initiatives should focus on:

1. Legal and regulatory expertise: Providing training and education programs for policymakers, legal professionals, and government officials to enhance their understanding of AI technologies, their applications, and the associated legal and regulatory challenges.

2. Technical and data governance skills: Building technical expertise in areas such as data management, algorithm development, and AI system deployment, as well as data governance practices and compliance with data protection regulations.

3. Strengthening enforcement mechanisms: Developing robust enforcement mechanisms, including independent oversight bodies, auditing processes, and grievance redressal mechanisms, to ensure compliance with legal frameworks and ethical guidelines.

4. Collaboration with research institutions and academia: Fostering partnerships with research institutions, universities, and international organizations to leverage their expertise, facilitate knowledge transfer, and promote innovation in AI applications for climate change adaptation and food security.

C. Inclusive and Participatory Approaches

The development and implementation of legal frameworks for AI governance in the Aral Sea region should involve inclusive and participatory approaches that engage diverse stakeholders, including:

1. Local communities and indigenous populations: Ensuring the meaningful participation of local communities, farmers, and indigenous populations in decision-making processes related to the adoption of AI technologies that may impact their livelihoods, agricultural practices, and traditional knowledge.

2. Civil society organizations and non-governmental organizations (NGOs): Engaging with civil society organizations, environmental advocacy groups, and NGOs to incorporate their perspectives, concerns, and recommendations into the legal and regulatory frameworks.

3. Private sector and industry stakeholders: Collaborating with private sector entities, including technology companies, agribusinesses, and startups, to leverage their expertise, promote responsible innovation, and ensure alignment with legal and ethical standards.

4. International organizations and development partners: Leveraging the support and expertise of international organizations, development agencies, and donor partners in capacity-building initiatives, knowledge sharing, and the provision of technical assistance.

D. Ethical and Human-Centric Considerations

Legal frameworks governing the use of AI in the Aral Sea region should prioritize ethical considerations and human-centric approaches, such as:

1. Incorporating ethical principles: Enshrining principles of fairness, non-discrimination, transparency, accountability, and respect for human rights into legal frameworks and guidelines for AI development and deployment.

2. Conducting impact assessments: Mandating algorithmic impact assessments and human rights due diligence processes to identify and mitigate potential risks and unintended consequences of AI systems, particularly for vulnerable and marginalized communities.

3. Promoting transparency and explainability: Establishing mechanisms to ensure the transparency and explainability of AI systems, enabling scrutiny, auditing, and public understanding of how these technologies operate and make decisions.

4. Fostering public trust and awareness: Implementing measures to raise public awareness and build trust in AI technologies

E. Fostering Regional Cooperation and Knowledge Sharing.

Given the transboundary nature of the challenges faced in the Aral Sea region, fostering regional cooperation and knowledge sharing is crucial for the effective adoption and governance of AI technologies. Specific recommendations include:

1. Strengthening regional cooperation frameworks: Utilizing existing regional organizations and initiatives, such as the International Fund for Saving the Aral Sea (IFAS) and the Regional Environmental Centre for Central Asia (CAREC), to facilitate cooperation, joint projects, and knowledge exchange on AI applications for climate change adaptation and food security.

2. Establishing regional centers of excellence: Developing regional centers of excellence or specialized institutions focused on AI research, development, and capacity building. These centers can serve as hubs for collaborative projects, knowledge dissemination, and the provision of technical assistance to countries in the region.

3. Enhancing data sharing and interoperability: Promoting data sharing agreements and developing common data standards and interoperability protocols to facilitate the exchange of environmental, agricultural, and socioeconomic data among countries in the region, enabling more effective AI applications and decision-making.

4. Facilitating cross-border technology transfer: Implementing mechanisms to facilitate the cross-border transfer of AI technologies, software, and hardware among countries in the Aral Sea region, while ensuring compliance with intellectual property rights and data protection regulations.

5. Promoting multi-stakeholder partnerships: Encouraging multi-stakeholder partnerships that bring together governments, research institutions, international organizations, civil society, and the private sector to collaborate on AI-driven solutions for climate change adaptation and food security in the region.

F. Leveraging International Support and Collaboration.

While regional cooperation is essential, leveraging international support and collaboration can provide valuable resources, expertise, and best practices to enhance the adoption and governance of AI technologies in the Aral Sea region. Key recommendations include:

1. Engaging with international organizations and development partners: Strengthening collaboration with international organizations such as the United Nations, the World Bank, and the Asian Development Bank, as well as bilateral development agencies, to access financial and technical assistance, capacity-building programs, and knowledge-sharing initiatives related to AI governance and applications.

2. Participating in global platforms and initiatives: Actively participating in global platforms and initiatives focused on leveraging AI for sustainable development, such as the AI for Good Global Summit organized by the International Telecommunication Union (ITU), to learn from best practices, share experiences, and contribute to the global discourse on AI governance.

3. Fostering North-South and South-South cooperation: Promoting collaboration and knowledge exchange with developed countries and other developing regions facing similar challenges, through mechanisms such as technology transfer agreements, joint research projects, and capacity-building initiatives.

4. Engaging with the private sector and technology companies: Collaborating with leading technology companies, research institutions, and AI startups to access cutting-edge technologies, expertise, and resources, while ensuring alignment with legal frameworks, ethical guidelines, and local priorities.

5. Contributing to international norm-setting: Actively engaging in international discussions and negotiations related to the development of global norms, standards, and guidelines

for AI governance, ensuring that the unique perspectives and challenges of the Aral Sea region are represented and addressed.

By leveraging international support and collaboration, countries in the Aral Sea region can access valuable resources, expertise, and best practices, while also contributing to the global discourse on AI governance and sustainable development.

V. Conclusion

The adoption of artificial intelligence (AI) technologies holds significant potential for addressing the complex challenges of climate change adaptation and food security in the Aral Sea region. However, realizing this potential requires robust legal and regulatory frameworks that promote responsible and equitable implementation while safeguarding individual rights, fostering innovation, and ensuring ethical and human-centric considerations.

This comparative analysis of international legal frameworks has highlighted the diverse approaches and best practices in areas such as data protection, intellectual property rights, algorithmic accountability, and ethical guidelines for AI governance. It has also emphasized the importance of international cooperation, capacity building, and inclusive multi-stakeholder engagement in developing and implementing effective legal frameworks.

By aligning with international standards, strengthening institutional capacities, and fostering regional cooperation and knowledge sharing, countries in the Aral Sea region can create an enabling environment for leveraging AI technologies to address the pressing challenges of climate change adaptation and food security. Simultaneously, prioritizing ethical considerations, conducting impact assessments, and promoting transparency and public trust will be crucial for ensuring the responsible and equitable adoption of these technologies.

Addressing the complex challenges faced by the Aral Sea region requires a holistic and collaborative approach that transcends national boundaries. By leveraging international support, engaging in global platforms, and contributing to the development of international norms and standards, the Aral Sea region can not only benefit from cutting-edge technologies and best practices but also contribute to the global discourse on AI governance and sustainable development.

Ultimately, the responsible adoption of AI technologies in the Aral Sea region will require a delicate balance between promoting innovation, protecting individual rights, and ensuring environmental sustainability and food security for present and future generations. This comparative analysis provides a foundation for policymakers, legal experts, and stakeholders to develop tailored legal and regulatory frameworks that address the unique challenges and priorities of the region while aligning with global best practices and principles.

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Резюме: Регион Аральского моря, охватывающий части стран Центральной Азии, столкнулся с серьезными проблемами деградации окружающей среды и продовольственной безопасности из-за сокращения Аральского моря и воздействия изменения климата. Технологии искусственного интеллекта (ИИ) стали многообещающим инструментом для решения этих сложных проблем, но их успешное внедрение требует надежных правовых и нормативных рамок. В этой статье проводится сравнительный анализ международных правовых рамок, регулирующих использование ИИ в области адаптации к изменению климата и безопасности пищевых продуктов, с особым акцентом на регион Аральского моря. В ней рассматривается правовой ландшафт в различных юрисдикциях, включая нормативные акты по защите данных, права интеллектуальной собственности, механизмы алгоритмической подотчетности и этические руководства по внедрению ИИ. В статье также исследуются региональные и международные соглашения, договоры и механизмы сотрудничества, имеющие отношение к региону Аральского моря, подчеркивая их потенциальную роль в содействии трансграничному сотрудничеству, гармонизации правовых рамок и инициативам по наращиванию потенциала. Выявляя передовой опыт, пробелы и области для гармонизации, это исследование направлено на информирование политиков и заинтересованных сторон в разработке всеобъемлющей правовой и нормативной базы, которая обеспечивает ответственное и справедливое внедрение технологий ИИ для адаптации к изменению климата и обеспечения продовольственной безопасности в регионе Аральского моря.

Резюме: Markaziy Osiyo mamlakatlarining bir qismini o'z ichiga olgan Orol dengizi mintaqasi Orol dengizining qisqarishi va iqlim o'zgarishining ta'siri tufayli atrof-muhitning jiddiy yomonlashuvi va oziq-ovqat xavfsizligi muammolariga duch keldi. Sun'iy intellekt (SI) texnologiyalari ushbu murakkab muammolarni hal qilishda istiqbolli vosita sifatida paydo bo'ldi, ammo ularni muvaffaqiyatli joriy etish mustahkam huquqiy va me'yoriy asoslarni talab qiladi. Ushbu maqolada iqlim o'zgarishiga moslashish va oziq-ovqat xavfsizligi sohalarida SI dan foydalanishni tartibga soluvchi xalqaro huquqiy asoslarning qiyosiy tahlili o'tkazilgan bo'lib, unda Orol dengizi mintaqasiga alohida e'tibor qaratilgan. Unda turli yurisdiksiyalardagi huquqiy muhit, jumladan ma'lumotlarni himoya qilish qoidalari, intellektual mulk huquqlari, algoritm hisobdorligi mexanizmlari va SI ni joriy etish bo'yicha axloqiy ko'rsatmalar ko'rib chiqiladi. Maqolada, shuningdek, Orol dengizi mintaqasiga tegishli mintaqaviy va xalqaro bitimlar, shartnomalar va hamkorlik mexanizmlari o'rganilgan bo'lib, ularning chegaralararo hamkorlikni rag'batlantirish, huquqiy asoslarni uyg'unlashtirish va salohiyatni oshirish tashabbuslaridagi potensial roli ta'kidlangan. Eng yaxshi amaliyotlar, bo'shliqlar va uyg'unlashtirish sohalarini aniqlash orqali, ushbu tadqiqot siyosatchilar va manfaatdor tomonlarni Orol dengizi mintaqasida iqlim o'zgarishiga moslashish va oziq-ovqat xavfsizligini ta'minlash uchun SI texnologiyalarini mas'uliyatli va adolatli joriy etishni ta'minlaydigan keng qamrovli huquqiy va me'yoriy asosni ishlab chiqishda xabardor qilishga qaratilgan.

Kalit so'zlar: Sun'iy intellekt, Iqlim o'zgarishiga moslashish, Oziq-ovqat xavfsizligi, Orol dengizi mintaqasi, Xalqaro huquq, Qiyosiy huquqiy tahlil, Ma'lumotlarni himoya qilish, Intellektual mulk, Algoritm hisobdorligi, Xalqaro hamkorlik.

Ключевые слова: Искусственный интеллект, Адаптация к изменению климата, Продовольственная безопасность, Регион Аральского моря, Международное право, Сравнительный правовой анализ, Защита данных, Интеллектуальная собственность, Алгоритмическая подотчетность, Международное сотрудничество.

**PROCEDURAL NATURE OF CRIME REPORTING AND INFORMATION ALSO
ELECTRONIC EVIDENCE**

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Summary: *The article analyzes the procedural nature of crime reports and information and electronic evidence. Also, the procedural differences of crime reports and information are studied.*

Key words: *crime report, information, electronic evidence, evidence, crime, procedure, criminal case, appeal, internet, court.*

The 21st century is the age of information. In this period, the factor inextricably linked with information is electronic, more specifically, factors related to data transmission, distribution, storage, reception and transfer. Therefore, during the analysis of the concept of data, it is necessary to pay attention to the concept of electronic data. Because, at present, a huge part of the information available in the criminal process is connected electronically and with electronic carriers. Also, the development of electronic tools makes it easier to collect and record information about crimes.

Another sign of the priority of human rights in the system of courts and law enforcement agencies is the presence of public organizations and citizen participation in law enforcement activities. Participation of public organizations and citizens in the activities of courts and law enforcement bodies is aimed at protecting legality and legal order, rights and freedoms of citizens. The current criminal procedural legislation provides for various forms of public participation in the trial of criminal cases. According to it, the investigator, the prosecutor and the court during the investigation and trial of criminal cases have the scope of their powers to determine the circumstances of the crime, to search for and expose the culprits, to issue a fair sentence, as well as to determine the causes of the crime and the conditions that made it possible. has the right to use public assistance [1, 96].

Provisions on electronic data in our criminal-procedural legislation are shown: in the fourth part 27-article, in the first part of 91⁴-article, in the eleventh part of Article 242¹, in the sixth part of Article 426, in the second part of Article 497⁶, in the second part of Article 509¹, in the eighth part of Article 531 of Criminal Procedure Code. However, the issue of electronic evidence is not yet provided for in the legislation. This is probably due to the evidentiary nature of electronic data and the ease with which it can be assembled.

Even if the concept of electronic evidence is not mentioned in the criminal proceedings, Article 91⁴ of the Criminal Procedure Code. in the first part, the procedural procedure is provided that the process and results of the investigation carried out in the mode of the video conference are written and recorded in the appropriate means that carry electronic data. This rule is one of the few procedural rules that indicate that electronic data can be used as evidence.

In other cases, electronic data regulate organizational and procedural issues in criminal proceedings: a) that appeals on procedural actions and decisions and documents attached to it can be sent to the court in the form of electronic documents; b) in necessary cases, electronic monitoring tools can be used against a person who has been placed under house arrest; v) electronic or other sources where audio and video recordings are stored during the court proceedings are attached to the minutes of the court session, in which a mark is placed that these tools were used; g) sending a notification to the persons who filed an appeal that they can get acquainted with the copies of the complaint, the protest or their electronic copies through the Internet resource of the court that issued the sentence; d) a copy of the complaint, protest is sent to the convicted person, acquitted person, their defenders, legal representative, victim or his representative, as well as civil claimant, civil defendant or their representatives, or a notice is sent that they can get acquainted with their electronic copies through the internet resource of the court of cassation instance; e)

sending the court decision to the state executive in the form of an electronic document on specific issues.

There are many definitions of electronic data among processualists. In particular, I.I. Litvin means that electronic data should be understood not as a set of letters and numbers, but as a set of messages that make up an electronic file [2, 41]. V. B. Vekhov [3, 18], T. E. Kukarnikova [4, 16], D. V. Ovsyannikov [5, 76], P. S. Pastukhov [6, 5] and other authors also emphasize the nature of electronic data and their ability to serve as evidence.

Of course, electronic data can do its job if it is recognized as electronic evidence.

Information, whether it is in electronic or software form, is mainly about its transfer from one source to another. It is this feature of data that is extremely important. In the same context, the criminal procedural nature of the information is determined. As A.A. Davletov explained in a very simple way: fact - information - knowledge. Here, the fact is the commission of a crime, information is a signal sent from the object to the mind of the subject, and knowledge is the collection of information about the crime by the subject [7, 89].

Hence, crime intelligence is extremely important in the investigation of crimes and the identification of the culprits. Information is a general category. Especially in modern times, the nature and content of information is changing somewhat. Since information has an interdisciplinary status (informatics, cybernetics, economics, jurisprudence, etc.), its status in the process is high. Because without information, the investigation cannot move forward. Information obtained as a result of investigative actions can be recognized as evidence after due investigation. Information obtained by means of non-procedural means (results of operational activities) should be used as evidence after a special examination and evaluation.

Thus, messages and information can be used to develop investigative versions in the criminal process, investigate, collect evidence, prove, expose the person who committed the crime, etc. used to identify issues, make appropriate decisions or perform actions. Both concepts describe the details of the crime and determine the course of action of the investigator and investigator in the respective criminal case.

Message and information are close words. While crime reporting and information are technically and essentially similar, there is a difference between them. They differ in terms of measurements and indicators in the message and data sheep:

First, information is a broad concept, and message is a relatively narrow concept;

Secondly, the message is directed to a specific subject, on the basis of which the necessary information is collected. More precisely, the message is not required by the inquirer or investigator, it is sent voluntarily by the sender. Information is sometimes explained by the requirement to provide it as a requirement or as an obligation;

Third, in the procedural field, a crime report is always sent before the crime information effort. First, a crime report is sent, and then the investigator collects information based on the content of the report;

Fourth, in most cases, the message can be directed to a wide audience without a specific address. Sometimes the message is directed to the addressee - a specific body or official. The message itself is sent to the body, and the information should be taken to the places;

Fifth, if the message is always addressed to someone, the information can be kept private.

Thus, the message and information about the crime are different. Both institutions are used in criminal procedural legislation, but their concepts are not presented in procedural legislation. It should be noted that nowadays the electronic form of messages and information is becoming extremely popular, and it is appropriate to apply this form of messages and information to the criminal procedural legislation more widely.

News and information, especially their electronic forms, are also provided by mass media institutions. Currently, the role of this institution in the field of criminal procedure is increasing due to the tendency of the mass media to provide news and information about crime.

Thus, the trend of technical possibilities leads to the increase of news and information about crime on the air and on the Internet. In particular, it is possible to observe that news and information about crime are published almost every day on Internet media pages. For this reason, the analysis of the concept of media messages and information is a necessary issue within the scope of scientific work.

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Rezyume: Maqolada jinoyat haqidagi xabarlar va malumotlar va elektron dalillarning protsessual xususiyati tahlil qilinadi. Shuningdek, jinoyatlar haqida xabar va malumotlarning protsessual farqlar ham o'rganiladi.

Резюме: В статье анализируется процессуальная природа сообщений о преступлениях, информации и электронных доказательств. Также изучаются процессуальные различия сообщений и информации о преступлениях.

Kalit so'zlar: jinoyat haqida xabar, ma'lumot, elektron dalillar, dalillar, jinoyat, protsessual tartib, jinoyat ishi, apellyatsiya, Internet, sud.

Ключевые слова: сообщение о преступлениях, информация, электронные доказательства, доказательства, преступление, процедура, уголовное дело, апелляция, интернет, суд.

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EXISTING TECHNOLOGIES AND METHODS IN PHYSICAL EDUCATION

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Summary: *The article describes the field of physical education (PE) that has evolved significantly, incorporating various technologies and methodologies to enhance student engagement and physical development. This article provides an overview of the current technologies and methods used in physical education, emphasizing their impact and effectiveness. The integration of existing technologies and modern methods in physical education (PE) has transformed the landscape of PE, making it more engaging, inclusive, and effective. The author notes that by leveraging these tools and approaches, educators can better meet the diverse needs of students and promote lifelong physical activity and health.*

Key words: *technology, methods, techniques, physical qualities, physical education.*

INTRODUCTION. According to researchers, pedagogical technologies are closely linked to information technology, highlighting the necessity of incorporating various technical tools into the teaching process. They assert that the core of pedagogical technology lies in the collaboration between teacher and student, ensuring a guaranteed outcome aligned with set goals. Effective educational technology organizes cooperative activities between teachers and students, enabling positive results when students can think independently, work creatively, search, and analyze. It also requires teachers to create opportunities and conditions for such activities, forming the foundation of the teaching process. Each lesson, topic, and subject have its own specific technology, making pedagogical technology an individualized process directed toward a singular goal based on the student's desire, aimed at delivering a pre-planned and guaranteed result. In the following we will look at some features of methodological tools in the PE.

As technology continues to evolve, it is essential for educators to stay informed about new developments and incorporate them into their teaching practices to promote physical activity and health among students. The integration of modern technologies and innovative methods in physical education has significantly enhanced the teaching and learning process.

Enhancing Student Engagement and Participation: Investigating existing technologies and methods in physical education is crucial for enhancing student engagement and participation. Modern technological tools and innovative methods can transform traditional physical education classes into dynamic and interactive sessions. By integrating these technologies, educators can create more engaging and enjoyable experiences that motivate students to actively participate, thereby improving their overall physical fitness and well-being.

Addressing Diverse Learning Needs: Physical education is not a one-size-fits-all discipline. Students have diverse learning needs and physical abilities that must be addressed to ensure inclusive and effective education. Researching existing technologies and methods helps identify adaptive and assistive tools that cater to various student requirements. This inclusivity ensures that all students, regardless of their physical abilities, can participate and benefit from physical education, fostering a more equitable learning environment.

Promoting Lifelong Healthy Habits: Understanding the efficacy of current physical education technologies and methods is vital for promoting lifelong healthy habits among students. By evaluating and implementing successful strategies, educators can instill a positive attitude towards physical activity from a young age. This foundation encourages students to continue engaging in physical activities throughout their lives, contributing to long-term health benefits and reducing the risk of chronic diseases.

Improving Skill Development and Performance: Researching the existing technologies and methods in physical education can significantly improve skill development and performance among students. Advanced tools such as motion capture systems, wearable fitness trackers, and interactive software provide real-time feedback and personalized training programs. These technologies help students understand their strengths and areas for improvement, enabling them to develop their skills more effectively and achieve higher levels of performance.

Supporting Data-Driven Decision Making: Incorporating research on existing technologies and methods in physical education supports data-driven decision-making for educators and policymakers. By analyzing data collected from various technological tools, educators can make informed decisions about curriculum design, teaching strategies, and resource allocation. This approach ensures that physical education programs are based on empirical evidence, leading to more effective and efficient outcomes.

Encouraging Innovation in Physical Education: Continued research into current technologies and methods encourage innovation in the field of physical education. By staying informed about the latest advancements and their applications, educators can experiment with new approaches and techniques. This culture of innovation fosters continuous improvement and adaptation, ensuring that physical education programs remain relevant and effective in a rapidly changing world.

Enhancing Teacher Professional Development: Finally, researching existing technologies and methods in physical education contributes to the professional development of teachers. Understanding and integrating new tools and techniques require ongoing training and education. This professional growth empowers teachers to deliver high-quality physical education, stay updated with industry trends, and effectively meet the needs of their students.

LITERATURE REVIEW. Physical education (PE) is a crucial component of the educational curriculum aimed at developing students' physical competence, health-related fitness, and positive attitudes towards physical activity. Over the years, various technologies and methods have been integrated into PE to enhance its effectiveness. This literature review explores the existing technologies and methods in physical education, highlighting their impact on student engagement, learning outcomes, and overall physical fitness. In the following there are traditional methods in physical education:

Traditional methods of physical education often involve direct instruction, where the teacher demonstrates a skill, and students practice it through repetition and drills. These methods focus on developing fundamental motor skills, sports-specific skills, and promoting physical fitness. Despite their effectiveness in skill acquisition, traditional methods are sometimes criticized for their lack of student engagement and limited opportunities for individualized instruction [7].

Technological Integration in Physical Education

1. **Wearable Technology.** Wearable devices, such as heart rate monitors, pedometers, and fitness trackers, have revolutionized physical education. These devices provide real-time feedback on students' physical activity levels, heart rates, and calories burned, allowing for more personalized and data-driven instruction. Studies have shown that wearable technology can increase student motivation and engagement in PE classes by providing tangible evidence of their progress [8].

2. **Mobile Applications.** Mobile apps tailored for physical education offer various features, including workout routines, instructional videos, and progress tracking. Apps like PE Geek and Sworkit have been used to supplement traditional PE classes, providing students with additional resources to practice skills and stay active outside of school hours. Research indicates that mobile apps can enhance student learning and promote continuous physical activity [1].

3. **Virtual Reality (VR) and Augmented Reality (AR).** VR and AR technologies create immersive environments that can simulate real-world physical activities and sports. These technologies have been used to teach complex movements and strategies in a controlled and safe environment. For example, VR can simulate various sports scenarios, allowing students to practice without the risk of injury. AR can overlay digital information on the physical world, enhancing the learning experience by providing real-time feedback and instructions [2].

4. Interactive Whiteboards and Smartboards. Interactive whiteboards and smartboards are increasingly being used in PE to display instructional videos, interactive games, and real-time performance data. These tools facilitate visual learning and can be used to demonstrate complex movements and techniques. Research has shown that interactive whiteboards can enhance student engagement and understanding of PE concepts [4].

Innovative Methods in Physical Education:

1. Cooperative Learning: Cooperative learning involves students working together in small groups to achieve common goals. This method emphasizes teamwork, communication, and peer support. Studies have found that cooperative learning can improve students' social skills, increase participation, and enhance learning outcomes in PE [3].

2. Game-Based Learning: Game-based learning incorporates elements of play and competition into the educational process. This method can include traditional sports, modified games, and digital games. Game-based learning has been shown to increase student motivation, engagement, and enjoyment in PE classes [5].

3. Personalized Learning: Personalized learning tailors instruction to meet the individual needs and interests of students. In PE, this can involve creating customized fitness plans, setting individual goals, and providing differentiated instruction. Personalized learning approaches have been found to improve student outcomes by addressing their unique needs and promoting lifelong physical activity [6].

In the following we will analyze the significance of existing technologies.

Wearable Technology: Devices such as fitness trackers and heart rate monitors are widely used to provide real-time feedback on students' physical activity levels, helping to personalize fitness goals and monitor progress.

Mobile Applications: PE-focused apps offer workout plans, instructional videos, and interactive challenges that promote student participation both in and out of school.

Virtual and Augmented Reality: These technologies create immersive experiences for students, making PE classes more engaging by simulating various sports environments and providing virtual coaching.

Interactive Whiteboards and Smartboards: Used for demonstrating exercises, showcasing instructional videos, and tracking student progress, enhancing the interactive aspect of PE lessons.

Modern Methods in Physical Education

Student-Centered Learning: This approach focuses on the individual needs and interests of students, encouraging them to take an active role in their physical development. Techniques include personalized fitness plans and self-assessment.

Inclusive Education: Ensures all students, regardless of their physical abilities, can participate in PE. Adaptive sports and modified activities are designed to be accessible to everyone.

Gamification: Incorporating game elements into PE lessons to make physical activities more enjoyable and motivating. Examples include point scoring, leaderboards, and rewards for achieving fitness goals.

Blended Learning: Combines traditional PE activities with online resources, allowing for a more flexible and comprehensive approach to physical education.

Project-Based Learning: Students engage in projects that require physical activity, such as organizing sports events or creating fitness programs, which helps them apply their learning in real-world contexts.

Impact and Effectiveness

Research indicates that the integration of modern technologies and methods in PE has numerous benefits:

Enhanced Engagement: Technologies such as VR and gamification significantly increase student interest and participation in PE activities.

Personalized Learning: Wearables and mobile apps enable tailored fitness programs that cater to individual student needs, leading to better health outcomes.

Improved Physical and Mental Health: Regular use of technology in PE helps track progress and maintain consistent physical activity, contributing to overall well-being.

Skill Development: Interactive and project-based learning methods promote not only physical skills but also teamwork, leadership, and problem-solving abilities.

DISCUSSION. Physical education (PE) has evolved significantly with the integration of modern technologies and innovative methods. These advancements aim to enhance student engagement, improve learning outcomes, and promote lifelong physical activity. This overview highlights the current technologies and methods used in PE, emphasizing their impact and effectiveness. Current Technologies in Physical Education are in the following:

1. Wearable Technology. Impact and Effectiveness:

Personalization: Wearable devices such as fitness trackers and heart rate monitors provide real-time data on physical activity levels, allowing for personalized feedback and goal setting.

Motivation: The immediate feedback from these devices can boost student motivation and encourage regular participation in physical activities.

Data-Driven Instruction: Teachers can use the collected data to tailor their instruction and address individual student needs, enhancing the overall effectiveness of PE programs.

2. Mobile Applications. Impact and Effectiveness:

Accessibility: Mobile apps provide easy access to workout routines, instructional videos, and progress tracking, supporting students both inside and outside the classroom.

Engagement: Interactive features and gamification in apps can increase student engagement and make physical activity more enjoyable.

Continuous Learning: Apps facilitate continuous learning and practice, helping students maintain their fitness levels even when not in school.

3. Virtual Reality (VR) and Augmented Reality (AR). Impact and Effectiveness:

Simulation: VR and AR technologies provide immersive experiences that simulate real-world physical activities and sports, allowing students to practice in a safe and controlled environment.

Skill Development: These technologies can teach complex movements and strategies, enhancing skill acquisition and performance.

Engagement: The novelty and interactivity of VR and AR can significantly increase student engagement and interest in PE.

4. Interactive Whiteboards and Smartboards. Impact and Effectiveness:

Visual Learning: Interactive whiteboards and smartboards facilitate visual learning through the display of instructional videos, animations, and interactive games.

Engagement: These tools can make lessons more dynamic and engaging, helping students better understand and retain PE concepts.

Collaboration: Interactive features promote student collaboration and participation, fostering a more inclusive learning environment.

Innovative Methods in Physical Education.

1. Cooperative Learning. Impact and Effectiveness:

Social Skills: Cooperative learning methods improve students' social skills, teamwork, and communication.

Participation: This method increases participation and engagement by emphasizing peer support and group work.

Learning Outcomes: Research indicates that cooperative learning enhances learning outcomes by promoting active involvement and responsibility among students.

2. Game-Based Learning. Impact and Effectiveness:

Motivation: Game-based learning incorporates elements of play and competition, which can significantly boost student motivation and enjoyment.

Engagement: This method increases engagement by making physical activities more fun and interactive.

Skill Development: Game-based learning supports the development of various physical skills and promotes a positive attitude towards physical activity.

3. Personalized Learning. Impact and Effectiveness:

Individual Needs: Personalized learning tailor instruction to meet the individual needs and interests of students, enhancing their learning experience.

Engagement: This approach increases student engagement by allowing them to set personal goals and work at their own pace.

Outcomes: Personalized learning has been found to improve student outcomes by addressing their unique needs and promoting lifelong physical activity.

There are numerous types and directions of modern pedagogical technologies, especially prevalent in vocational colleges. These include student-oriented education, didactic games, interactive exercises, creating problem situations, and the design method. Utilizing advanced pedagogical technologies and interactive methods aligned with the goals and tasks of vocational colleges represents a modern approach to organizing pedagogical councils and other events. Among these methods, the "Cluster" (networking) method is frequently used across various subjects and interpreted in different ways. Adaptations of the "Cluster" method for different subjects include cluster-belt, cluster-oval, cluster-star, and cluster-grape, among others. The "Cluster" method is an interactive approach and forms a specific type of pedagogical-didactic strategy [11]. It aids in expanding students' thinking abilities by analyzing a specific object, revealing various aspects, and fostering the development of students' mental processes. This method enhances students' vision, intuition, imaginative speed, speech, and thinking. During such training sessions, participating educators are divided into small groups or assigned individual tasks. They analyze assigned tasks or problems from pedagogical and psychological perspectives in cooperation with the training leader, and summarize their conclusions.

CONCLUSION. To sum up, researching existing technologies and methods in physical education is essential for enhancing student engagement, addressing diverse learning needs, promoting lifelong healthy habits, improving skill development, supporting data-driven decision-making, encouraging innovation, and enhancing teacher professional development. This research ultimately leads to more effective, inclusive, and dynamic physical education programs that benefit both students and educators. The integration of modern technologies and innovative methods in physical education has significantly enhanced the teaching and learning process. Wearable technology, mobile apps, VR/AR, and interactive whiteboards have provided new opportunities for personalized, engaging, and effective PE instruction. Additionally, innovative methods such as cooperative learning, game-based learning, and personalized learning have improved student engagement and learning outcomes. Wearable technology, mobile apps, VR/AR, and interactive whiteboards provide new opportunities for personalized, engaging, and effective PE instruction. Additionally, cooperative learning, game-based learning, and personalized learning methods have improved student engagement and learning outcomes. As technology continues to evolve, it is essential for educators to stay informed about new developments and incorporate them into their teaching practices to promote physical activity and health among students.

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Rezyume: Maqolada talabalarning faolligi va jismoniy rivojlanishini oshirish uchun turli texnologiyalar va metodologiyalarni o'z ichiga olgan, yuqori darajada rivojlangan jismoniy tarbiya (PE) ta'lim jarayoni haqida so'z boradi. Ushbu maqolada jismoniy tarbiya ta'limida qo'llaniladigan zamonaviy texnologiya va usullar haqida umumiy ma'lumot berilgan, ularning ta'siri va samaradorligi ta'kidlangan. Jismoniy tarbiya (PE)dagi mavjud texnologiyalar va zamonaviy usullarning integratsiyasi jismoniy tarbiya ta'lim jarayonini yanada qiziqarli va samaraliroq qiladi. Muallifning ta'kidlashicha, ushbu vosita va yondashuvlardan foydalanish orqali o'qituvchilar talabalarning turli ehtiyojlarini qondirishi va uzluksiz jismoniy faollik va salomatlikni mustahkamlashi mumkin.

Резюме: В статье рассмотрено область физического воспитания (PE), которая значительно изменилась, включив в себя различные технологии и методологии для повышения вовлеченности учащихся и их физического развития. В данной статье представлен обзор современных технологий и методов, используемых в физическом воспитании, подчеркнув их влияние и эффективность. Интеграция существующих технологий и современных методов физического воспитания (PE) изменила ландшафт физкультуры, сделав его более привлекательным, инклюзивным и эффективным. Автор отмечает, что, используя эти инструменты и подходы, преподаватели могут лучше удовлетворять разнообразные потребности учащихся и способствовать физической активности и здоровью на протяжении всей жизни.

Kalit so'zlar: texnologiya, usullar, texnikalar, jismoniy sifatlar, jismoniy tarbiya.

Ключевые слова: технология, методы, приемы, физические качества, физическое воспитание.

COMPOSITION OF A PUBLICISTIC TEXT

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Summary: The article deals with the study of lexical and semantic features of the journalistic text, the meaning of the text, its name, the stylistic methods used by the author to reveal the topic, as well as the scientific analysis of the text.

Key words: Stylistic figures, text, publicistic, functional, stylistic, composition, method

In this article, we would like to dwell on the characteristics and qualities of publicistic text. As parts of its composition, it is possible to show dynamism, intensity, and pathos. The journalistic text is distinguished by being emotional, full of opinions, and prone to transparency. The sharp socio-political reflection of life is combined with artistic-aesthetic methods, which together are characterized by attraction to the work of art. Media style gives strength, sharpness, brightness to the artistic work, fills it with social content and humanism. Such a style is bright, attracts, excites the soul proves that the author himself is not indifferent to the problems being embodied. In this case, the strict description, even without giving too much attention to feelings, in some cases becomes a form of journalistic reflection of life, Mikhail Romm's excellent film "Ordinary Fascism" is an example of this.

When we talk about the lexical-semantic properties of the text, the tropes, synonyms, homonyms, obsolete words, neologisms, parcels, typical of the content of the text, which show the author's style when revealing the topic in depth, are studied for the purpose of using vulgarisms in the artistic work.

Consolidation through parcels (partseller). The term parcellation is derived from the French word partseller, which means "to divide into parts", and it should be studied in the field of syntax of language knowledge [1].

In the science of language, this term is used according to the disintegration of the sentence with the purpose of expressiveness, i.e., the removal of one part of the sentence, which is intended to be omitted. In the oral language, in the text, there is sometimes a break in a whole sentence related to communication. When the speaker informs the listener about some event, he tries to separate the most important idea from the others and interpret it separately. If this repetition is carried out using tools such as intonation, pause, and logical emphasis in the spoken language, it appears in the text through repeated arrangement of text components - text components according to the expressive-stylistic goal.

Stylistic figures. The syntax method is widely used to ensure the impact of the beautiful text. Stylistic figures occupy a different place among the artistic tools of the language. Stylistic figures are differently constructed syntactic fragments or sentences, which serve for figurative language. The following types of stylistic figures are more often used: inversion, polysyndeton, aposiopesis, anaphora, epiphora, parallelism, rhetorical direction, rhetorical question, gradation, antithesis, oxymoron.

Another way to divide the text into types is the functional stylistic feature of the language. According to the functional and stylistic features of texts, scientific texts (scientific works, thesis, articles, lectures, opinions), literary texts, official documents (references, decisions, orders, protocols, characteristics) are publicistic. divided into texts.

The word methodology is derived from the Greek language, *metodos* – "way", "method", *logos* – "instruction". That is, it is the science of correct organization of theoretical and practical activities of a person. In the process of linguistic analysis of the text, it is appropriate if it is carried out based on the following principles: The principle of the unity of form and content, the principle of the unity of place and time, determining the relationship of the language of the beautiful text to

the national language and literary language, determining the units of poetic actualization in the beautiful text, and determining the intertextual units in the beautiful text.

Unity of form and content. The relationship between objects and events in existence can be seen from the dialectic of form and content. Dialectic unity of form and content is necessary for any text. Philosophers interpret content as a set (complex) of internal elements and changes that include a specific object and events. Considers form as a way of representing content, as an organizer. Form and content are inextricably linked, a deficiency in one can affect the other.

A beautiful text is a complex aesthetic whole, unique both in terms of form and content. The content is as important as the form. Sometimes, form can rise to the level of content, influence the importance of content. In a beautiful text, the author's skill in shaping the content, individual characteristics in it are of particular importance. In the linguopoetic analysis of the famous text, first of all, unity of form and content should be studied as a separate principle. No matter how well-crafted a work of art is, it will fail to satisfy the reader if you cannot clearly understand what the writer is trying to convey. Conformity of form and content plays an important role for the clear and complete view of the author's artistic goal.

The principle of unity of space and time. When studying the linguistic properties of a literary text, it is necessary to take into account the concept of time and place for each event. Any work of art arises in relation to place and time. In the language of historical works of art, there are lexical-grammatical units that make it clear where and in what environment the events that give the spirit of the time are taking place. The concept of place and time is not a characteristic of fine art only. It applies to any type of text. When analyzing on the basis of this principle, it is necessary to choose one of the diachronic and synchronic aspects depending on the period in which the text was written, the topic raised in the text, and the nature of the text units.

It is possible to find out where, at what time, and among what people this conversation took place from the quoted passage. Both questions and answers are short and clear. It is known that the intonation of a request embodies politeness and feelings of pity. And from the answer, the cleverness of the hero is illuminated. When we analyze the literary text from a linguopoetic point of view, it is necessary to take into account the concept of unity of place and time. The reason is that any work of art is created in relation to time and place.

The principle of determining the ratio of the language of the literary text to the national language and the literary language. It is impossible to study the historical side of the language of fiction without separating it from the national language. There are two types of literary text: 1) modern text (created in the present time) 2) historical text (created in the past). In turn, we can see two types of modern text: a) text on today's topic; b) a text on a historical topic. For example, Sh. Seytov's novel ("Jaman shıganaqtaǵı Aqtuba"), "Oktuba with a bad shell" tells about the events of his time. T. Qayıpbergenov's trilogy ("Qaraqalpaq dástanı") "The Tale of Karakalpak" and A. Sodikov's novel "Bostansız búlbıl (Nightingale)" are historical works of art.

The principle of identifying poetic topical language units in a literary text. One of the important principles is to determine the actual poetic language units in the work of art. By revealing the linguistic and artistic aspect of such tools, it is possible to clearly develop the mechanisms of the formation of the artistic text.

The principle of determining the linguistic and semantic features of intertextual mechanisms in a literary text. Identifying other types of texts used in the text (prose studies, proverbs, hadiths, narrations, myths, legends, didactems, excerpts from the work of this or that writer, etc.) and how compatible they are with the content of the artistic work; Thinking about the important situations in the linguistic and semantic connection of rni with the main text is very necessary in revealing the linguopoetics of the artistic text.

The following research methods are very important in determining the specific features of the language of a work of art.

The method of using language units interchangeably. This method is used to determine the beauty of the language of the work of art, reliable output, authorship of the writer. It is intended to

repeat the words, sentences, phraseology used in the work of art, to replace them with similar ones, and to evaluate them on this basis.

In phraseological units, we will use the one that is compatible with the desire of our thought to describe synonyms. In the above example, in order to figuratively express the meaning of the word “quickly”, the writer skillfully used the phraseology “between your eyebrow and your eye”, “before you blink”, “before you blink” (“*qosh bilan ko'zing orasida*”, “*ko'zni ochib yumguncha*”, “*qosh qoqquncha*”). These units cannot be replaced by a synonym or another single word. If it is replaced, it will have an adverse effect on the artistry of the artwork.

Comparison of text options. By this method, the text of one particular work of art is compared with other versions, and the linguistic features, the author's point of view, and aesthetic intention related to the idea of the work of art are revealed. This method gives a good result in studying the writer's work on the language of the artistic work, defining the writer's corrections, skill in using the language.

Method based on dictionaries. When studying the language of a work of art, especially a work of art on a historical theme, or linguistic features of translated works, it is necessary to rely on appropriate dictionaries. There is a need to create a dictionary for works of art created several years ago. Vocabulary work is one of the most important resources for increasing students' vocabulary. With the help of this dictionary, detailed information is provided not only about the literal meaning of words, but also about their figurative meanings, which language unit each word belongs to, etymology, and morphological structure.

The method of creating an index of language units. During the analysis of the literary text, it is required to compile an index of language units in the literary work. For this purpose, first of all, the units (for example, phraseologisms, synonyms, antonyms, metonymy, metaphors) that are often used in the work of art and are characteristic for the beauty of the work of art are defined. Then it is sorted alphabetically. It serves as a factual material in illuminating the writer's language skills.

Studying the composition of a publicistic text is of paramount importance for several reasons:

1. Understanding Communication Dynamics: Publicistic texts serve as key channels for conveying information, opinions, and perspectives to the public. By studying their composition, we gain insights into how language is strategically organized to communicate effectively with specific audiences, whether it be through newspapers, magazines, online articles, or opinion pieces.

2. Analyzing Persuasive Techniques: Publicistic texts often aim to persuade, inform, or influence readers' opinions on various social, political, or cultural issues. Examining their composition allows us to identify persuasive strategies such as rhetorical devices, argumentative structures, and linguistic features used to engage readers and shape their understanding of the subject matter.

3. Cultural and Societal Reflection: Publicistic texts reflect the cultural and societal context in which they are produced. By analyzing their composition, we can uncover underlying ideologies, values, and norms prevalent in a particular community or society. This helps in understanding how public discourse is shaped by broader cultural and social dynamics.

4. Enhancing Critical Thinking: Studying the composition of publicistic texts cultivates critical thinking skills by encouraging readers to evaluate the credibility, reliability, and bias inherent in the text. This empowers individuals to critically engage with media representations, question assumptions, and make informed judgments about the information presented.

5. Improving Writing Skills: For aspiring writers, journalists, and communicators, analyzing the composition of publicistic texts provides valuable insights into effective writing techniques, style conventions, and genre-specific conventions. By studying exemplary texts, writers can learn to craft engaging, well-structured pieces that resonate with their intended audience.

6. Promoting Media Literacy: In an era of widespread misinformation and fake news, understanding the composition of publicistic texts is essential for fostering media literacy. By

equipping individuals with the skills to analyze, interpret, and evaluate media content critically, they become more discerning consumers and active participants in public discourse.

In conclusion, studying the composition of publicistic texts offers a multifaceted approach to understanding communication processes, persuasive strategies, cultural dynamics, and societal values. It empowers individuals to engage critically with media representations, contribute meaningfully to public discourse, and navigate an increasingly complex media landscape with confidence and insight.

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Rezyume: *Maqolada publitsistik matnning leksik va semantik xususiyatlari o'rganilib, matn ma'nosi va nomlanishi, muallifning mavzuni ochib berishda qayday stilistik uslublardan foydalanganligi tahlil qilingan.*

Резюме: *В статье рассматриваются способы формирования доходов местных бюджетов. Также изучены значение и динамика изменения местных налогов и сборов в формировании доходов местных бюджетов.*

Kalit soʻzlar: *Mahalliy byudjet, soliq, foiz, mol-mulk soligʻi, daromad.*

Ключевые слова: *Местный бюджет, налог, проценты, налог на имущество, доход.*

**FORMATION OF LEARNING MOTIVATION OF STUDENTS BY WORKING ON THE
TEXT OF A WORK OF ART**

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Summary: *The article deals with the child's educational activity, the formation of learning motivation, creative thinking of younger schoolchildren, educational material, the role of the 4K model, and an innovative approach. Also, in the article, the author's attitude to the events, the teacher's professional qualities, and the individual characteristics of the students when working on the artistic text have been described. The author states that any artistic work depicts specific historical events, and the teacher can give a true assessment of the work if he has a historical approach to those events.*

Keywords: *primary class, independent work, artistic work, educational motivation.*

Introduction. Cultivating creative thinking and speech of primary school students, nurturing the qualities of openness to mutual relations is directly related to the development of their learning and learning motivation. This aspect mainly places great responsibility on teachers. Effective implementation of these tasks is possible on the condition that the students of this age take into account the interests and inclinations of the students, and use the methods of stimulating a positive emotional impact on their motivational sphere. These are: success support; desire to make work interesting; encourage healthy competition; consists of the use of various effective methods of organizing cognitive activity. Therefore, in order to create a positive motivation for learning, the teacher can create a problem-research situation in the classroom. It is to set a specific cognitive task for students that involves confrontation, creates discussion, prompts reflection, research and conclusions.

In practice, motivation to study is often manifested in the form of interest. The learning material should be related to the student's daily life experience. Since the main need of a person is to understand the world and express himself in it, educational activities that provide this knowledge include a powerful source of internal motivation. An important factor in increasing student learning motivation is creating conditions for success. This can include game tasks during the lesson. Educational material presented in the form of a game creates an upbeat mood in the student. The following can be indicated as common reasons that lead to a decrease in interest in studying among students:

- excessive demands of parents;
- insufficient assessment of the child's activities by family members;
- frequent conflicts in the family related to the child's education;
- general mastery of students.

Primary school age has a large reserve for the formation of learning motivation. This is the beginning of the formation of learning motivation, on which the fate of the child depends in many ways throughout the school period. Therefore, the main content of motivation at this age is to teach the child to learn. The responsible formation of the motivational sphere by the teacher from the position of "with the child" in parallel with the development of emotional and volitional aspects helps to create a personal view of the world in the student. With this, communication, development of independent decision-making ability, self-discipline and organization of successful relationships in society, concentration, that is, subsequent gradual education of the individual are carried out. The nature of the joint activity of the teacher and students, the type of interaction (in cooperation or individually), the position of children and adults in the subsequent activities depends on how goal setting is carried out. In this regard, the 4 K model has a great role in the development of 21st century skills of teamwork, communication, creativity and research.

Literature review. The 4 K's include four principles: collaboration, communication,

creative thinking and critical thinking. The specific characteristics of each principle are reflected in the following:

Collaboration - refers to the formation of the skills of cooperation, exchange of ideas and support of learners. Today, textbooks are created based on this approach and serve to develop students' teamwork skills.

Communicativeness is aimed at the goal of students' speech to be understandable, simple and fluent, to be able to listen to others, and to develop the skills of using language tools to convey their thoughts.

Creative thinking - students learn to use modern approaches within the framework of the problem to discover knowledge that is new for them, develop the skills of searching for solutions and solving complex situations.

Critical (critical) thinking - this principle is related to the development of students' skills of critical and logical approach to the problem, formation of personal point of view.

According to D. Norboeva, she emphasizes that the application of the new approach does not require special conditions, its application depends only on the teacher's skills, it is wrong to say that there are no conditions for their application in schools, and admits the following: "The result of the new innovative approach can be seen in the growth of the student's outlook and thinking. Must have 21st century skills. This is the main goal of using an innovative approach. Moreover, the main goal of education is not only to give students knowledge, but also to teach them to apply the knowledge they have acquired in life [1].

We agree with the author on this point. After all, it all depends on the teacher's love for the child, his deep sense of responsibility for his fate, improving his professional skills and working on himself.

Methodology. The use of the 4K model in reading classes directly affects the process of motivation formation. If the goal is well-defined, clear to all, and relevant to all students, then it will motivate students and the whole team. The more relevant, clear and attractive the goal, the more successful the stage of planning, preparation and implementation, students will work diligently and vigorously to achieve it. For example, at the goal setting stage, the teacher asks "Shall we start the lesson?" should get an answer to the question. It is then appropriate for students to identify what problems they have and what they would like to work on. Students in groups discuss their proposals, after which the captain should report on the proposals. Participants come out and create a lesson plan on an interactive whiteboard or use mind maps:

1. The beginning of the lesson.
2. Introduction to the lesson: "Mindfulness exercise".
3. "Intellectual test": repetition.
4. Working with a group: "Helping to learn!"
5. "I can do it myself!"
6. The end of the lesson.

In this way, it is possible to organize the activity of students' acceptance of the lesson goal. The lesson plan created by children helps to form independent educational activities, modeling, logical planning of action, awareness of their problems and ways to solve them. Now the child acts as a subject who is responsible for his own actions. It is suggested to organize small project works based on the components of the 4K project principles on the development of life skills in reading classes, which will help students from lower classes to work as a team, be active in mutual relations, express their personal views independently, direct them to educational research (creative research), independent knowledge. It is also important because it includes such qualities as motivation to learn, critical approach to the problem.

Pedagogical scientist Sh.Abdullaeva believes that the project "develops students' knowledge, skills and abilities; finding the necessary information in the information space; organize their knowledge independently; to be able to incorporate knowledge of various fields; has the potential to teach critical thinking" [2]. U. Bekmuratova stated that the project "implements a

complex teaching method that involves practical application, analysis and evaluation of knowledge and skills. Learners are involved in planning, organizing, monitoring, analyzing and evaluating the results of the task to a greater extent than using other teaching methods. The advantages are:

1. Demonstration is ensured.
2. Time can be saved.
3. Motivation - students' work and knowledge are encouraged.
4. An effective result is achieved" [3].

Researcher J. Tohirov evaluates the project as "creative independent work planned to be carried out under the guidance of the teacher". In the course of our observations and literature analysis, we found it appropriate for the teacher to take into account the existence of a problem when organizing project work, plan to conduct educational research to find its solution, define approaches that ensure independent work of students, create a project algorithm and show the results of each stage. Project topics can be related to works in the curriculum or chosen based on student interests. In the process, it is desirable to make the topic of practical importance and to create a foundation for the integration of several disciplines. The success of everything depends on the inquisitiveness, initiative, management ability of the teacher. It is appropriate to plan the project work as follows:

1. The subject, type and number of implementers of the project are determined.
2. Ways to solve the problem and suggestions are studied.
3. Instructions for doing the work are explained to the students.
4. Participants are assigned tasks.
5. Interviews are held regarding the performance of work.
6. The project is protected.
7. Presentation of project work is organized.

The stages of project implementation can be defined as follows. [4]. According to Methodist R. Tillaeva, an important aspect of educational research is "searching for the characteristics of the object of knowledge, narrowing it down and applying them to new situations. The high level of the student's research activity is realized during the search for new, previously unknown aspects of the studied object. The process of searching for unfamiliar information is a combination of research, experience, and personal discovery. Based on the findings, students are guided to find their new ideas in different directions and apply them as much as possible [5].

Discussion. In reading classes, the process of reading the text and completing the tasks depends on the students' existing knowledge in most cases. Some students partially or completely master the features of the work, the main idea in it, the author's point of view independently in the process of completing the assignments. In order to form a correct conclusion in them, it is necessary to draw the attention of students to the structure of the text. Because, whatever aspect of the text interests the reader, he pays more attention to that aspect if he likes it. This shows that working on the text depends on the interests and motivations of the students. Therefore, it is important for the teacher to match the goal with the student's motivation and interest.

The important aspects of working on the text are to develop students' speech through the use of rationally selected methods and tools, to be able to interest the artistic work and make certain changes to it. At first, it is appropriate to pay attention to the teaching of the text in different ways, to determine the types of reading and their characteristics, the importance of reading in education. In this regard, as professor S. Matchonov rightly pointed out, "Reading a work of art does not mean anything by itself. The most important thing is what to read and how to understand what is read. So reading is not determined by the number of books read, but it is reading with understanding, that is, purposeful reading [6].

In our opinion, turning elementary school students into real executors of the learning process provides a wide opportunity for the formation of learning motivation. The teacher can realize this aspect directly through artistic works. Because the artistic work directs the student's thinking, conscious perception, analysis and influence of its content to the development of learning motives.

It is known that any artistic work partially or fully reflects social relations, life problems, human nature and its relationship to society. The description of the environment in the work of art with the help of images has theoretical and practical importance for the methodology. Therefore, it is important to take into account the pedagogical and psychological features of working on an artistic work in primary education.

Students of the 3rd-4th grade give different opinions and conclusions based on the morale, inner experiences, and character of the characters while analyzing the artistic text, that is, they evaluate their personality based on some quality of the character. They may have some confusion in expressing their opinion. During this period, they avoid tasks, because many art texts in the textbook consist of questions and tasks. After all, students don't want to take their knowledge too much. That is, they feel a desire to speak more independently. Through this, they gradually think independently and try to prove their views through evidence.

After the 4th grade, students become more independent, like to spend more time on things that are interesting to them than on discipline. This can be explained by the strong tendency to perform each task independently. In this period, they are interested in tasks that were not encountered in the previous stages. Therefore, if the lessons are organized using different methods of working on the text, and the tasks are created taking into account the needs, inclinations and interests of the students, they will develop the ability to clearly express their thoughts. The fact that the teacher explains this through real life examples, that literary materials are given in textbooks in a way that matches the nature and age characteristics of children, that the questions and tasks presented on the texts are not similar to each other will further activate their behavior towards working on the text.

In continuous literary education, several stages of working on the text of an artistic work have been developed. The main task of primary education is to form the literacy necessary for general secondary education. During this period, through reading lessons, small texts suitable for the age of the students are given. Unintelligible words are summarized and explained in the form of a separate dictionary on the basis of texts from the primary class. One of the means of developing students' speech in reading classes is retelling and analysis of the content of artistic texts, formation of fast, conscious and expressive reading skills.

By explaining the ideological and thematic foundations of any artistic text, its images, plot line, construction and visual means, it ensures the general development of students as a person, the growth of speech, thinking, and imagination. One of the important conditions of the analysis is that the reader gets acquainted with the work and works on its text, relying on his life experience to consciously perceive the content of the work. The analysis of the text of the work of art forms the educational activity of students, helps to expand their knowledge about the environment.

In considering the emotional impact of literary text analysis, there are aspects that readers should first consider. In this case, the teacher should not only read and listen to the work while reading, but also the author should be able to be excited by the event, and tell the story to the level of being able to form an aesthetic taste. When working on a literary text, the teacher's attention is focused on the author's reaction to the events described in the work. This requires the teacher to develop professional qualities and use different approaches, taking into account the individual characteristics of his students. Another aspect is that any artistic work depicts specific historical events. The teacher can give a true assessment of the work only if he can take a historical approach to those events. Also, it is appropriate to explain the writer's life and creative views in an age-appropriate manner. Later, in the process of transition to higher classes, it is possible to focus on the explanation of the ideological aspects of the work. The next stage includes grades 5–9 of general secondary education. At this stage, that is, within the framework of general secondary education, in-depth knowledge in specific directions (sports, fine arts, social and humanitarian) begins to be provided in order to form the learning motivation of students. If we look at the reading lessons, at this age, texts that are larger in size, more approachable to independent thinking and can form learning motivation begin to be given.

In our point of view, working on the text of the work is an emotional process. As the content of literary education expands and becomes more complex, the educational activities of students should be strengthened in order to achieve mastery. This serves to change their attitude towards the reading of works of art, to increase their desire to know. Therefore, interest is an expression of students' choice of an object or activity and their attitude towards it. "How do you imagine the various items, objects, and equipment that are involved in the reality of the characters (for example, how old they are (based on comparing this character with someone in real life, such as Komron's brother, Zilola's moon, Shahrukh's dad, my grandmother)) interest in what they are doing (in what form, color, size, quantity they are), filling their thoughts about it, enriching it with new qualities is of special importance in forming the students' imagination [7].

Being able to make students interested in working on the text of the work is a means of distraction from the content of the academic subject, the formation of the skills of understanding, comprehension and perception of the art work being read, aesthetic pleasure and other things that lead to reading. The acquisition of a given artistic work or material depends to a large extent on the training of the will. Volitional activity is one of the necessary conditions of literary education. The process of literary education itself is a willful growth in students, and through this, the daily routine of students teaches them to study and use their time wisely. Researcher M. Askarova points out the following factors in this regard: "Due to difficulties in reading, students have a constant slow attitude towards reading, which affects the overall development of the individual. In such a situation, special attention and control is necessary for reading. All students develop reading skills, but not all have the same level of listening and comprehension skills. This shows that it is important to choose effective methods and tools for teaching students to read and understand the text. Therefore, it is necessary to solve this problem starting from the primary school [8].

Conclusion. In conclusion, it can be said that working on the text of the work is an emotional process. As the content of literary education expands and becomes more complex, the educational activities of students should be strengthened in order to achieve mastery. Because being able to make students interested in working on the text of the work consists of the content of the academic subject, the formation of the skills of understanding, understanding and perception of the art work being read. And this, in our opinion, makes primary school students into real executors of the learning process, creating a wide opportunity to form learning motivation.

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Rezyume: Maqolada bolaning o'quv faoliyati, uquv-biluv motivin shakllantirish, boshlang'ich sinf o'quvchilari ijodiy tafakkuri, o'quv material, 4 K modelining o'rni, innovatsion yondashuv haqida so'z etilgan. Shuningdek, maqolada badiiy matn ustida ishlashda muallifning asarda tasvirlangan voqealarga munosabati, o'qituvchining kasbiy sifatlari, o'quvchilarining individual xususiyatlari haqida so'z boradi. Muallifning ta'kidlashicha, har qanday badiiy asarda aniq tarixiy voqealar tasvirlanadi, va o'qituvchi o'sha voqealarga tarixiy yondashsa asarga haqqoniy baho bera olishi mumkin.

Резюме: В статье рассматривается учебная деятельность ребенка, формирование мотивации обучения, творческого мышления младших школьников, учебный материал, роль модели 4К, инновационный подход. Также в статье говорится об отношении автора к событиям, описанным в произведении, профессиональных качествах преподавателя, индивидуальных особенностях учащихся при работе над художественным текстом. Автор говорит, что любое художественное произведение изображает конкретные исторические события, и педагог может дать правдивую оценку произведению, если у него есть исторический подход к этим событиям.

Kalit so‘zlar: boshlang'ich, sinf, mustaqil ishlar, badiiy, asar, o'quv-biluv motivatsiyasi.

Ключевые слова: начальный, класс, самостоятельная, работа, художественная деятельность, учебная мотивация.

**INDEPENDENCE OF THE JUDICIARY AND JUDGES - GUARANTEE OF THE
SUPREMACY OF LAWS AND THE CONSTITUTION**

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Summary: *The article scientifically analyzes the formation and development of the judiciary, the efforts made towards judicial reform during the development of New Uzbekistan, the constitutional and legal foundations, and also discusses the scientific opinions put forward by supporters of various approaches to the concept and true independence of the judiciary and judges, as well as the role and their significance in ensuring the rule of law in society, proposals and recommendations that have theoretical and practical significance are outlined.*

Keywords: *Strategy "2030-Uzbekistan", period of development of New Uzbekistan, judicial system, true independence of the judiciary and judges, legal environment, rule of law, rule of law, justice.*

One of the most important tasks of the democratic renewal of our country at the current stage is to strengthen the rule of law and legality, and the consistent democratization of the judicial system aimed at reliable protection of individual rights and interests.[1, 27-31]

Effective provision of human rights and freedoms in our country at the current stage of development of new Uzbekistan depends to a large extent on judicial authorities and their effective activities. Establishing an independent and fair judicial authority in Uzbekistan is a priority of state policy, and it has become one of the main issues in the constant focus of our country's President Shavkat Mirziyoyev [2, 118-122]. In his Address submitted to the Oliy Majlis, the head of state focused on improving the judicial system in order to ensure justice and the rule of law in our country, improving the court system, raising the level of citizens' access to justice, improving the quality of hearing cases in court, and making impartial and fair verdicts and decisions, equality of parties and His specific proposals regarding the practical implementation of judicial reforms, as well as the practical implementation of judicial reforms based on advanced foreign experiences, clearly confirm the importance of judicial reforms [3] After all, the court is the highest point of justice and increasing its role is a legal process towards the establishment of a legal democratic state [4. 136-142] In particular, April 30, 2023 in our country In the referendum of the Republic of Uzbekistan held on" [4. 136-142] created the political and legal foundations for the construction of a fair and modern state in the service of the people, New Uzbekistan, and determined the priority directions for the further development of the state and society, including the judicial system, at the historically important stage of the development of national statehood. First of all, Chapter XXIII of the newly revised Constitution was dedicated to the judiciary. In this chapter, first of all, in the Republic of Uzbekistan, justice is carried out only by the court, and the judiciary acts independently of the legislative and executive authorities, political parties, and other institutions of civil society [5]. In addition, the judiciary should act independently of the legislative and executive authorities, political parties, other public associations, the procedure for organizing courts and the judicial system of the Republic of Uzbekistan, in which the powers of the Constitutional Court, as well as the status, rights and duties of judges, and the documents issued by them, should be determined by the republic. constitutional and legal norms, which are important for the organization and functioning of the independent judicial power, as they are mandatory for all subjects in the entire territory, have taken place

Speaking about this, it is appropriate to note that during the years of independence, significant results were achieved in the fundamental reform of the judicial system in our country. In particular, in order to consistently implement the constitutional principle of the separation of powers, the Law "On Courts" was adopted in a new version. Criminal-procedural and civil-procedural legislation was seriously reformed. These, in turn, made it possible to remove the courts

from the influence of executive authorities and control bodies. If we dwell on the general description of the judicial power of the Republic of Uzbekistan, first of all, it is necessary to analyze the definitions and concepts given to this power institution in the scientific literature and legislation. Most citizens have a more complete impression of the judiciary than the legislature and executive [1, 27-31]. However, it should be noted that there is no unanimity in the legal literature regarding the concept of power under consideration. In jurisprudence, to date, two different approaches defining the content of judicial power are visible. According to the Russian scientist I. Ya. Foynitsky, who thinks in the first direction, the judicial power "constitutes a system of law-abiding bodies called to apply laws in the course of court proceedings". [3.158.]. Yu.A.Dmitriev and G.Chernomirikh agree with his opinion and evaluate the judicial power as "a system of state and municipal bodies that have the authority to determine the truth, restore justice and punish the guilty, and whose decisions must be executed by officials [4.48.]. Representatives of the second approach understand the judicial power as the activity of reviewing court cases. S.V. Poznyshchev considers the judicial power not to perform the administrative and legislative functions of the state power, but to the bodies that "implement the laws and confirm their rule in life, fight against arbitrariness and violence [1. 77-78.].

Two important aspects stand out in the concept of judicial power put forward by the supporters of both of the above approaches. The first is substantive, according to which judicial power is evaluated as the authority to resolve disputes in society using a specially established procedure. The second is organizational, which is evaluated by the fact that these powers belong only to the courts. It would be absurd to oppose these two aspects. At this point, the definition given by the Plenum of the Supreme Court of the Republic of Uzbekistan to "judicial authority" deserves attention. It says: "Judicial power is the authority of courts to consider criminal, civil, economic (currently economic) cases and administrative offense cases based on the principle of the primacy of the Constitution and laws of the Republic of Uzbekistan" [6, 5]. Despite the fact that this definition is simple and understandable, it does not express the important function of the judiciary in most countries, the task of exercising constitutional control.[7, 15]. Different approaches to judicial power in legal literature must meet the requirements of the current level of normative legal practice. Therefore, it is necessary to give a general scientific definition to the concept of judicial power, not in terms of its decision-making, functions, forms and principles of activity, but in terms of its essence and content of activity, social function and place in society.

Judiciary is a part of the judicial system of the state and has certain state powers by the courts that consider and resolve legal disputes arising between legal entities in any sphere of society regulated by law, influencing their behavior, forming a legal environment in society, and other forms of authority. is a separate, independent and impartial branch of state power aimed at ensuring their balance and confirming the rule of law in society by actively influencing the decisions and actions of its two branches [8, 49.]. The judicial system in our country is the Constitutional Court of the Republic of Uzbekistan; Supreme Court of the Republic of Uzbekistan; military courts; Court of the Republic of Karakalpakstan, regional and Tashkent city courts; Administrative Court of the Republic of Karakalpakstan, administrative courts of regions and Tashkent city; inter-district, district, city courts for civil cases; district and city courts for criminal cases; interdistrict, district, city economic courts; consists of inter-district administrative courts [9]. Judiciary is a part of the judicial system of the state and has certain state powers by the courts that consider and resolve legal disputes arising between legal entities in any sphere of society regulated by law, influencing their behavior, forming a legal environment in society, and other forms of authority. is a separate, independent and impartial branch of state power aimed at ensuring their balance and confirming the rule of law in society by actively influencing the decisions and actions of its two branches.[10, 49]. Along with the above, in the Republic of Uzbekistan, courts can be specialized according to the categories of cases. It is important to note that it is not allowed to create emergency courts. The Constitutional Court has a special place in the system of judicial power of the Republic of Uzbekistan. In particular, the Constitutional Court is a state body authorized to hear cases on the

compliance of legislative and executive power documents with the Constitution [11]. Another important aspect of the new version of the Constitution of the Republic of Uzbekistan is that now the legal status of the Supreme Council of Judges of the Republic of Uzbekistan, the order of its powers and activities have been recognized at the constitutional level. the role of this body in the life of the judiciary is incomparable. After all, the Supreme Council of Judges of the Republic of Uzbekistan is a body of the community of judges, which helps to ensure compliance with the constitutional principle of independence of the judiciary in the Republic of Uzbekistan. Based on this, the legal status of the Supreme Council of Judges and the main areas of activity were defined as follows: The Supreme Council of Judges of the Republic of Uzbekistan is an independent body of the judicial community, which ensures the formation of the corps of judges and the observance of the constitutional principle of independence of the judiciary [12]. The Supreme Council of Judges performs the following tasks, which are extremely important for the judicial system of the Republic of Uzbekistan: selection of candidates for judicial positions on the basis of competition, appointment of judges from among the most qualified and responsible specialists, as well as forming a corps of judges based on recommendations for appointment to the positions of leading judges. Article 135 of our Constitution states that judges are independent, subject only to the Constitution and the law.

It is not allowed to interfere with the activities of judges in the administration of justice in any way, and such interference is a cause of responsibility according to the law. A norm was established that judges are not accountable for certain cases[13].

The Department for ensuring the activity of courts operates under the Supreme Court of the Republic of Uzbekistan. According to the Regulation on the Department of Courts under the Supreme Court of the Republic of Uzbekistan, the Department under the Supreme Court is a state body that performs the functions of material and financial support of the courts [3.]. Of course, judicial reforms have reached a new stage. But there is still work to be done in this regard, because in our opinion, it is appropriate to pay more attention to the following main priorities in order to further reform the judicial system, effectively protect the rights and freedoms of citizens, and increase the trust in the court. we calculate::

- the legal, organizational, procedural and material-technical basis for the sector should be strong;
- Ensuring the true independence of the judiciary based on the tasks defined in the "Uzbekistan-2030" strategy;
- to further strengthen legal guarantees of effective protection of rights and freedoms, legal interests of citizens, business entities and foreign investors;
- it is necessary to increase the level of access to justice.[15]

In conclusion, it is important that individuals have a high level of confidence in the judiciary, and the time and place requires reforms in this regard. Consequently, reforms in the judicial system are an integral part of general legal reforms.

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Rezyume: Maqolada mamlakatimizda sud tizimining umumiy tavsifi, sud hokimiyatining shakllanishi va rivojlanishi, Yangi O'zbekiston taraqqiyot davrida sud-huquq isloxlari yo'lida olib borilayotgan sa'y-harakatlar, uning Konstitutsiyaviy va qonuniy asoslari taxlil qilinib, sud hokimiyati va sudyalarning haqiqiy mustaqilligi tushinchasiga, jamiyatda qonun ustuvorligini ta'minlashdagi urni, ahamiyati va mazmun-mohiyatiga xar xil yondashuvlar keltirilib, ular tomonidan ilgari surilgan yondashuvlarga ilmiy fikr yuritilib, nazariy hamda amaliy ahamiyatga ega bo'lgan taklif va tavsiyalar bayon etilgan.

Резюме: В статье научно проанализированы формирование и развитие судебной власти, усилия, предпринимаемые на пути судебной реформы в период развития Нового Узбекистана, конституционно-правовые основы, а также обсуждаются научные мнение выдвигаемые сторонниками различных подходов к понятию и подлинной независимости судебной власти и судьи а также роли и значение их в ходе обеспечения верховенства закона в обществе, излагаются предложения и рекомендации, имеющие теоретическое и практическое значение.

Kalit so'zlar: “O‘zbekiston -2030” strategiyasi, Yangi O'zbekiston taraqqiyot davri, sud tizimi, sud hokimiyati va sudyalarning haqiqiy mustaqilligi, huquqiy muhit, huquq hukmronligi, qonun ustuvorligi, odil sudlov.

Ключевые слова: Стратегия “2030-Ўзбекистана”, период развития Нового Ўзбекистана, судебная система, подлинная независимость судебной власти и судьи, правовая среда, верховенства права, верховенства закона, правосудие.

**EMPATHIC COMPONENT OF LINGUOETHICS IN THE LINGUISTIC PICTURE OF
WORLD IN ENGLISH AND KARAKALPAK LANGUAGES**

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Summary: *This article highlights the understanding and appreciation of how language shapes and reflects human emotions, perspectives, and experiences within the Linguistic picture of the world in language. It delves into questions such as how language can be used to empower or oppress, how it influences social interactions and perceptions, and how it reflects cultural values and norms.*

Keywords: *semantic, discourse, ethnos, ethical dilemmas, interpretation of language, semiotic code, cognition, pragmatics.*

INTRODUCTION. The growing interest in the traditional problem of the relationship between language and culture in the 90s of the twentieth century predetermined the emergence of the new science of linguoculturology. Scientists see the significance of linguoculturology as a complex field of scientific knowledge about the relationship and mutual influence of language and culture in the objective integrative trend in the development of the humanities, the need for linguists to master the results obtained by representatives of related branches of knowledge, as well as in the interpretation of language as a means of concentrated understanding of collective experience, which is encoded in all the wealth of meanings of words, phraseological units, social texts, formulaic etiquette situations. [1.3-16 pages.]

Linguoculturology (from the Latin *lingua* - language, *cultura*- culture, *logos* teaching) has its own object of study-the relationship and interaction of language and culture in the process of their functioning and the object of study - material and spiritual culture as components of the Linguistics picture of world. According to E. Benveniste, linguoculturology was created on the basis of the triad - language, culture, human personality. [2. P.447.] In otherwords, it explores “the material culture and mentality embodied in the living national language and manifested in linguistic processes in their effective continuity with the language and culture of the ethnos” [3. P.288.].

As it is known, linguoculturology studies the relationship between language and culture, language and ethnicity, language and mentality in their interaction. V.T. Klovov proposes to carry out this research within the framework of a semiotic approach. At the same time, culture and language are brought to an equivalent level, where culture is understood as content, and language is the form of existence of this content. The methodology of linguocultural research within the framework of this approach is based on the idea that language is a semiotic code, a speech system, and culture which is the sum of certain information accumulated in the social environment. This method is seen by V.T. Klovov as the most balanced, based on a unified view of the nature of language and culture. [4. 60-67 pages.]

In the structure of the linguistic personality of Yu.N. Karaulov identifies the following levels: semantic-grammatical, ensuring language proficiency; cognitive, responsible for the formation and transformation of individual knowledge (picture of the world); pragmatic, allowing a person to carry out textual activity.

*at the first level, the constitutive concept is an associative-verbal network,

*at the second level - a personal thesaurus,

*at the third - a motivational system.

According to scientific definitions, a linguistic personality is understood as a person as a native speaker[5.], capable of speech activity, i.e. speech personality; a set of features of human verbal behavior, using language as a means of communication, a communicative personality. [5.]

It is recommended to start by examining the semantics of key ethical concepts in English. This involves looking at the meanings of words related to ethics, such as "justice," "morality,"

"virtue," "integrity," "fairness," and "compassion." It is important to consider how these words are defined in dictionaries and how they are used in different contexts. Furthermore, investigating the collocational patterns of ethical terms in English. Analyzing the words that frequently appear alongside ethical concepts, it is possible to explore how these collocations contribute to the overall understanding of ethics. For example, "social justice," "moral dilemma," or "ethical behavior" all provide insights into the nuances of ethical discourse. Not only analyzing semantics we can find out the linguistic picture of world, but also, metaphors such as "the moral high ground," "slippery slope," or "gray area" can reveal underlying conceptualizations of ethics and morality. Learning idiomatic expressions and proverbs related to ethics in English, these linguistic expressions often encapsulate cultural values and norms regarding ethical behavior. For instance, "actions speak louder than words" emphasizes the importance of behavior over mere verbal claims, reflecting a moral emphasis on integrity and sincerity.

As it is well-known, how ethical concepts are portrayed in literature, film, television, and other forms of media in English-speaking societies. Literature, in particular, offers rich narratives that explore complex ethical dilemmas and moral values. Also Digital Communication shows how ethical concepts are discussed in digital communication platforms, such as social media, online forums, and blogs which hashtags, memes, and viral content that engage with ethical concerns and moral dilemmas considering how the internet has facilitated new forms of ethical discourse and activism in the English-speaking world. Furthermore, while focusing on English, it's also valuable to consider cross-cultural perspectives on ethics. Discovering how English-speaking cultures compare to others in terms of ethical values, norms, and linguistic representations; this comparative approach can provide insights into the universality or cultural specificity of ethical concepts.

As an analyst claims to find out the ethical moral of the world picture of English language by beginning by defining the ethical concepts. These could range from broad ideas like justice, freedom, and responsibility to more nuanced concepts like virtue ethics, consequentialism, or deontology. As above mentioned, these ethical concepts are represented linguistically in English; this includes examining vocabulary, idiomatic expressions, proverbs, and metaphors related to ethics. For example, phrases like "do unto others as you would have them do unto you" reflect the golden rule, a foundational ethical principle. By conducting a comparative analysis of ethical concepts in English, one can gain a deeper understanding of how language both reflects and shapes our ethical worldview. This interdisciplinary approach bridges linguistics, philosophy, cultural studies, and sociology, offering valuable insights into the complex relationship between language and ethics. Nevertheless, it is difficult to find out information about Linguistic picture of the world of Karakalpak language, as there is less data on the Internet depicting the Linguistic spheres, linguaculturology in English language. That is the reason, there is need to do research on the ethical components of the linguistic picture of world in Karakalpak language illustrating with examples in English language. In recent decades, the term "empathy" (from the Greek *empathia* empathy, sympathy) has become widespread in all humanitarian disciplines. But many properties of this phenomenon remain poorly studied.

Insufficient attention has been paid to the study of historically established norms and standards of empathic thinking and behavior, studying their role in formation of ethical thinking of the individual. In this regard, let's consider ethical traditions shaped by empathy. Knowledge of the world in terms of good and evil, truth and untruth, justice and injustice is an important indicator of ethical thinking. Undoubtedly, an important component of the ethical nature human is empathy. A person's ability to empathize is a key factor in the formation and development of moral oriented personality who understands the world in the light of the requirements of ethics and morality. The ability to empathize forms moral motivation, develops the personality and the system of its ethical reactions. Empathy as a property personality acts as a motive for certain forms of behavior and plays an important role in a situation of moral choice underlies highly valued moral qualities: conscientiousness, kindness, dignity, mercy, the ability to love and forgive. Morality begins with understanding the inner world of people, with the ability to put oneself in the place of another and

look at the world through his eyes. At the same time, empathy is a prerequisite for true love for people. Empathy is represented by the following adjectives: sensitive, receptive, understanding, insightful.. Sensitivity and receptivity express the sensual, emotional ability to empathy and are associated with the inner world - heart, soul; understanding and insight are associated with the cognitive functions of the individual - intelligence, reason, wisdom.

In the Karakalpak Linguistic picture of the world, the tendency towards empathy is expressed bright enough. The essence of emotional empathy is conveyed by the following idioms:

Júregi sizlaw:-to be sick at heart;

Sag'an janim qiyналip tur- my soul feels pity for you;

kewlime tiydi- hurt my soul; reaches the heart;

Ishim jandi- burning inside;

Shin kewilden- from the heart.

So, in the linguistic picture of the world in Karakalpak language, the act of empathy is accompanied painful state of mind. In each case, a heartfelt participation is taken (a heartfelt empathy). This clearly demonstrates that Karakalpak linguistic ethics is based not so much on rational understanding problems of another person, as much as the desire to respond emotionally to his problems. Empathy includes being caring, sensitive and respectful towardsto all living things (plants, animals): *Oni da Alla jaratqan- God created it; Allaniń jaratılısı- that is also God's creation.* As it is well-known, Karakalpak nation is Muslim, that is the reason the word “Alla” (Allah) is used in the speech. Eventhough, a person who is incapable of empathy is “hard”, “cold” heart: *tas ju'rek.* In conclusion, the study of the English and Karakalpak Linguistics picture of world allowed to determine differences in the mastery of reality by data representatives cultures in an ethical context. Functioning of Linguistics picture of world in English and Karakalpak languages indicate partial universality and specificity of the way of conceptualizing reality in different systems languages. The ethical linguistics picture of world of Karakalpak and English which is expressed in fundamental key of culture, contains centuries-old experience, ethical thinking of generations and characterizes the ethical culture of the ethnic group in linguistic aspect.

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Rezyume: *Ushbu maqola tilda dunyoning lingvistik rasmida inson his-tuyg'ulari, istiqbollari va tajribalarini qanday shakllantirishi va aks ettirishini tushunish va qadrlashni ta'kidlaydi. U qanday qilib tilni kuchaytirish yoki zulm qilish uchun foydalanish mumkinligi, uning ijtimoiy o'zaro ta'sirlar va in'ikoslarga qanday ta'sir qilishi, madaniy qadriyatlar va me'yorlarni qanday aks ettirishi kabi savollarni o'rganadi.*

Резюме: *В этой статье подчеркивается понимание и оценка того, как язык формирует и отражает человеческие эмоции, точки зрения и опыт в рамках лингвистической картины мира в языке. Он углубляется в такие вопросы, как то, как язык может использоваться для расширения возможностей или угнетения, как он влияет на социальные взаимодействия и восприятие и как он отражает культурные ценности и нормы.*

Kalit so'zlar: *semantik, nutq, etnos, axloqiy dillemlar, til talqini, semiotik kod, idrok, pragmatika.*

Ключевые слова: *семантика, дискурс, этнос, этические дилеммы, интерпретация языка, семиотический код, познание, прагматика.*

HISTORY OF THE LIBERATION MOVEMENT IN KARAKALPAKSTAN OF THE XIX CENTURY IN ENGLISH-LANGUAGE LITERATURE

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Summary: *This article describes the importance of the action of freedom of the people of Karakalpakstan in the nineteenth century and their research in a foreign language abroad.*

Key words: *the history of Karakalpakstan, foreign literature, foreign historical schools, foreign researchers, English-speaking authors*

“An exceptionally significant place in the process of revival and growth of national self-consciousness, national pride, emphasized the first President of the Republic of Uzbekistan I.A. Karimov, - occupies historical memory, restoration of the objective and true history of the people, native land, territory of the state” [1.134].

The publication of the decrees of the Government of the Republic of Uzbekistan “On the preparation and publication of the New History of the Republic of Uzbekistan” and “On the activities of the Institute of History of the Academy of Sciences of the Republic of Uzbekistan” indicates that domestic historical science, if it really claims to be a science, will have to undergo a radical revision of the accumulated knowledge, their rather thorough revision.

The negative consequences of the Soviet society, the lack of pluralism of opinions and wide international scientific contacts, for many years made it difficult for Karakalpak historians to turn to the materials of foreign authors. The negative consequences of ignoring the achievements of foreign historiography still hinder progress in this area today.

The sprouts of a creative approach to the study of foreign material about Karakalpakstan began to break through already in the period of gaining independence and sovereignty in the works of B.A. Koshchanov and A.M. Dzhumashev, in the candidate dissertations of S. Nurzhanov and R. Sapaev. Nevertheless, there is no comprehensive study in domestic historiography, where a scientific analysis of foreign literature on the history of the liberation movement of the peoples of Karakalpakstan in the 19th century would be given.

While most of the materials, unique in their content, are the works of foreign authors, such as Seymour Becker, Richard Pipes, Alexander Park, Width Akiner, William Mendel, have no analogies. Taking into account the achievements of foreign science on the history of Karakalpakstan not only makes it possible to rethink many traditional stories, but also allows you to see new horizons, get out of the vicious impasse of self-isolation in the study of the historical path traveled by the peoples of Karakalpakstan.

The following problems remain relevant in Russian historiography:

- study of the main trends of scientific and professional interest of foreign authors of the history of Karakalpakstan;
- determination of the influence of external, internal political and personal factors on the development of certain problems in the history of Karakalpakstan in various countries;
- comparison of methods of using archival and literary materials on the history of Karakalpakstan by foreign authors;
- studying the ideas and conclusions of foreign researchers and political scientists on the nature of popular uprisings on the territory of Karakalpakstan in the 19th century.

The main attention should be focused on the analysis of foreign literature on a wide range of key issues in the history of Karakalpakstan, including:

- the uprising of 1827;
- the uprising of 1855-1956;
- the uprising of 1858-1959.

In the assessments of popular uprisings in the territory of Karakalpakstan, there is much more politics and emotions than a holistic, objective and scientific approach. It is necessary to highlight the main provisions of foreign historical schools regarding these events, continuing the

traditions of modern domestic historiography. Western scholars have done a lot to understand the history of Karakalpakstan in the 19th century. Recently, there has been an active process of introducing our historians to foreign historiography.

Foreign researchers Seymour Becker, William Mendel, Richard Pipes, Geoffrey Wheeler, Alexander Park, Baimirza Khait, Shirin Akiner and others have written works that are distinguished by originality and unexpectedness of the subject matter and posing questions. Among them, an important historiographical source is the monograph by Seymour Becker, Doctor of Philosophy, Professor of Rutgers University (USA) "Russian protectorates in Central Asia: Bukhara and Khiva in 1865-1924" Professor of the Center for Central Asian Studies at Columbia University (USA) Edward Alfred Olward published a monograph in California in 1990 under the title "Modern Uzbeks: the history of culture from the 19th century to the present day". Shirin Akiner, a Turkish woman, director of the Central Asian Research Forum at the University of London (Great Britain) is interested in the history, political events, science, culture of the Central Asian republics of the last two centuries. She published the monographs "Muslim Peoples of the Soviet Union" (London, 1986), "Cultural Changes in Central Asia" (London, 1991), [2; 4-7].

However, foreign researchers used fragmentary and incomplete sources with significant gaps and gaps in the study of national-state processes in the Khorezm Republic. Some conclusions of foreign authors are in the nature of hypotheses and assumptions, not always confirmed by archival documents. By the way, Western researchers were the first to understand this, who, not limited to simple conversations and complaints about the closed nature of the archives, are much more active and persistent in trying to gain access to the archives. The Russian imperial policy towards the indigenous peoples of the Khiva Khanate was somewhat different. In foreign English-language historiography, it is believed that it was less interventionist than the policy of other European colonial powers. For example, it is said in the report of the Director of the Central Asian Research Forum of the University of London Shirin Akiner [3; 42].

The study of the works of foreign English-speaking authors on the history of Karakalpakstan is of great scientific importance. Work in this direction is still being carried out by a small group of historians. We need scientific controversy and dialogue with foreign colleagues.

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Rezyume: Ushbu maqolada XIX asrda Qoraqalpog'istonda xalq erkin harakatining o'ziga xos tavsifi va ularning chet tillarda olib borilgan izlanishlari haqida ma'lumot berilgan.

Резюме: В этой статье говорится о важности описания действий свободы народа Каракалпакстана в XIX веке и их исследования на иностранном языке за рубежом.

Kalit so'zlar: Qoraqalpog'iston tarixi, chet el adabiyoti, xorijiy tarixiy maktablar, chet el tadqiqotchilari, ingliz tilida so'zlashuvchi mualliflar

Ключевые слова: история Каракалпакстана, зарубежная литература, зарубежные исторические школы, зарубежные исследователи, англоязычные авторы

LEXICAL-GRAMMATICAL PROPERTIES OF THE WORD IN THE CONTEXT AND ADAPTATION

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Summary: *This article talks about the loaned words which were taken from other languages into Karakalpak at the end of the XX and beginning of the XXI century. It also mentions morphological-semantic relationships.*

Key words: *loaned words, morphology, semantic, karakalpak language, foreign language, lexical unit, grammatical category, noun, vocabulary, linguistics.*

The process of morphological and semantic transformation of a specific lexical unit is complex and cannot be accepted in one sense. First of all, it is impossible to clearly establish the relations between the two transmitting and receiving systems, because the morphological process of bringing words into circulation through reworking can occur in the place of Karakalpakstan and may have already been mastered. In some cases, it is very difficult to determine the linguistic origin of a word, because when we talk about several connections of a certain lexical unit from different languages, that is, the unit can be taken from the Karakalpak language on the basis of a valid language. Difficulties also arise in the question of whether a clear lexical unit belongs to a certain morphological category in the receiving language.

It is possible to distinguish between the educational exercises that are considered from the perspective of "Foreign language - this is a change". For example, V.G. Demyanov defines the following: [1,25]

- 1) In connection with the linguistic adaptation of foreign language words, the practice of the types of inflection;
- 2) practice the inflection of foreign language words;
- 3) the practice of creating derivatives from foreign words and the degree of productivity of derivative affixes.

Therefore, the meanings of the same word in the target language and in the receiving language are usually realized in composite morphological-semantic relations. The words of a foreign language, which are related to a certain grammatical category in the mother tongue, have a motivational meaning, are adapted from another language, not only structurally (externally), but often semantically as well, but they can be freely connected to any part of the adapted word in the language.

In our thematic group, we distinguish the following models of nominations related to morphological-semantic relationships:

1. Action → subject

The education in this module is very effective, for example, the specific semantics of food names in the Karakalpak language is related to the process of their preparation:

Biscuits (from the French language, literally translated to mean *double-boiled*) is a pastry dough based on eggs.

Roast beef (from the English language, when translated literally means *to (fry) roast beef*) is a piece of stewed beef.

Compote (derived from the German language and translated literally means *mixing, to be in the component*) is a drink made from fruits and vegetables.

Mashed food (taken from the French language and literally translates *to mash*) is a kind of thick mass.

2. Subject → subject

- a) In the Karakalpak language, the names of foods appeared in connection with this model that was the main, copiable the attribute:

beefsteak (taken from the English language and translated literally means *a piece of beef*) - a piece of cutlet made from crushed beef.

juice (from the French language borrowing, when translated literally means *juice*) is a liquid seasoning for food;

6) this model is also used in Karakalpak language to form subject terms in terms of external similarity between something:

Waffle (derived from the German language, when translated literally means *honeycombs, cells*) is a dry biscuit with rough cells, usually filled with filling.

Pudding (taken from the English language and translated literally means *a smooth look*) is a food made from dough, grain, cottage cheese, and other related products.

Vermicelli (derived from Italian and translated literally means *"worms"*) is a doughy food made from thin crust.

filet mignon (taken from the French language and translated literally means *the division of the cut object into parts*) - small parts of the meat.

Starch (derived from the German language and translated literally means *hard flour*) is a powdered adhesive of starchy vegetables.

3. Sign → object

According to this model, adjectives related to the names of foods with motivational properties appear:

jelly (taken from the French language and literally translates as *frozen*) is a frozen mass of elastic consistency.

candy (taken from the French language and translated literally means *mixed with sugar*) – lollipops.

4. Name of the person → item

We should also mention that this given model is widespread in many thematic groups, and here the names of individuals become nicknames: bolivar (S. Bolivar – banknote and men's broad-brimmed hat), nagan (L. Nagan - a type of revolver) and others. According to this model, noun names are created after someone or something:

Madera (taken from the Portuguese language and named after the name Madeira) is a type of strong grape wine.

Champagne (taken from the French language and named after the province of Champagne) is grape wine.

Charlotte (taken from French and named after Charlotte) is a hot dish made from dough and fruits.

Port wine (taken from the German language, named after the Portuguese city "*Porto*" + "*wein*" meaning *wine*) is a strong grape wine.

It seems that the stream of borrowed words will continue to enter our society, and it will not fail to show its influence on the lexicon of the Karakalpak language, and it will affect the expansion and enrichment of the lexicon of the Karakalpak language.

The vocabulary of a foreign language in the Karakalpak language traditionally arouses the interest of linguists. The study of theoretical and practical exercises as a result of the interaction of various language systems has a certain importance due to the intercultural activity at the present time. Linguistic communication is considered to be the interaction of several languages influencing each other. One of the most favorable conditions of linguistic communication is considered to be bilingualism, that is, the way an individual can understand two languages. We should also mention that this given concept is primarily related to the degree of language stability, which is determined by the possibility of structural change at different levels of the language. Although lexical change is one of the most widespread types of change, when words enter the target language from various sources of life, the Karakalpak language is also characterized by a process similar to structural change.

The construction of a word in a foreign language is understood as the external structure of the lexical unit, which is the arrangement and order of the parts that ensure its integrity. However, we must also remember that representatives of all languages can understand the morpheme structure of the words in question depending on their linguistic competence and linguistic ability. According to M. Martysyuk: "many possessive words in the modern language are morphologically indistinguishable from each other." [2,57]. If we look at knowledge of a foreign language from a different point of view typical of language representatives, it is possible and right to consider that it is possible to separate individual words. For example, E. Haugen, classifying borrowed words according to their structure, distinguishes between hybrid variants (imperfect copy), i.e., words that came from a foreign language and were built from original elements [3,344-382].

Looking at the structure of the foreign language lexicon of the Karakalpak language from the point of view of separation and non-separation, we distinguish the following types of constructions.

1. Words that do not require transliteration.

First of all, it is possible to see lexical units from the point of view of singular or plural. Words may retain a tendency to be structurally corrected in the language they have adopted over a long period of time. Custom words that cannot be transliterated are considered to be custom words that phonetically and graphically correspond to the target language. They should be distinguished from compounds in foreign languages, their use is connected with the need to depict the society, customs, behavior and traditions of a nation or state. If this group of lexical units has graphic inscriptions in the Karakalpak language, or does not require translation, it cannot be connected with foreign language compounds. In this case, we should talk about untransliterated words. As an example, we can consider the following words and conditional abbreviations: CD (English, compact disk), bye (English, see you later), Ltd (English, limited) - limited liability company, OK (English, good), VIP (English, very important person).

2. Transliterated words that match the prototypes in structure

At the time of transliteration, the word in a foreign language is pronounced according to the rules of the native language, but slows down to graphic assimilation. In addition to this group of words, it is logical to include words that have undergone phonemic adaptation in the Karakalpak language (that is, they have phoneme inconsistencies associated with the introduction of foreign language vocabulary into the Karakalpak language). As an example, the following words are changed in the transliteration tool: bestseller ("bestseller" in English), pineapple ("ananas" in German is a tropical plant and its fruit), screening ("screening" in English is a medical examination of the local population or checking the creditworthiness of partners), allegri (in Italian "allegri" "lottery where one game is played after buying a ticket), pawnbroker (French "Lombard" credit institution), present (French "présent" sale), syrup (French "sirop" concentrated solution), innovator (Latin "novator" following progressive principles person), screenshot (using "screenshot" in English, the image you see on the monitor screen), cruise (in English "cruise" is a sea trip along a closed route), motel (in English "motel" is a hotel for motorists), muscat (French "muscat" is a grape and dessert wine), poltergeist (German "Poltergeist" is a supernatural phenomenon), addressee (German "Adressat" receiving), short track (in English "short track" is a type of sport played on ice skates) and many others.

In the Karakalpak language, proper noun was transliterated at the time of the change. For example, Washington (English "Washington"), London (English "London"), Mississippi (English "Mississipy"), Ray Charles (English "Ray Charles") and others.

3. Transliterated words based on grammatical substitution.

A) Loaned words transliterated by adding affixes to the host language. The lexical units that made up this group were adapted to the accepted language to such an extent that they began to participate in the word formation process in the Karakalpak language. A word that accepts the affixes of this receiver takes the substituted words into its case. Examples include tartinka (French "tartine" is a piece of bread with something added or spread on it), marinating (French "mariner" to

prepare something in a marinade), breading (German "panieren" to coat in breadcrumbs or flour before frying) [4,64], frikadelka (from the German "Frikadelle" a ball made of minced meat) and many other words can be mentioned.

Б) Abbreviated words transliterated by shortening of relative affixes. In this case, the lexical unit in the Karakalpak language can have its own "abbreviated" appearance. For example: plumber (French "plombières") - ice cream made from sour cream and egg yolk; profi (German "Professional") - professional; tattoo (French "tatouage") - drawing on the human body by applying paints under the skin; parameter (Greek "parametron") - a term describing some property of a process or substance included in formulas; Infarct (Latin "infarctus") is a necrosis center in tissues and others due to impaired blood circulation.

4. A foreign language is a combination of a noun and a defining word of the host language.

From the etymological point of view, the word clarity of the Karakalpak language may not be the most authentic Karakalpak, but it is accepted as such by the speakers due to the fact that it entered the language very early or was actively used in various spheres of life. In such cases, the adjective (characteristic) is used to specify the concept of a foreign language. As an example, we can consider the following words: lemon caramel (French), linden tea (Turkish), plum, apple (according to taste) sauce (French), ketchup (in terms of national component) produced in Holland, Tatar (in English).

5. The concept of a foreign language is replaced by the Karakalpak equivalent combination

The entry of a foreign language word into the Karakalpak language is determined by the presence of two options in it, i.e. borrowed words and word chains in the Karakalpak language. For example, vinaigrette (French) is French okroshka, tomato (Italian) is green apple, kartoffel (German) is apple.

We should accept it as a fact that no language is structurally isolated, agglutinative or inflective. The lexicon of a foreign language adapts to the system of the Karakalpak language, shows dynamics in all directions, and undergoes certain changes. Analyzing structural inconsistencies between languages provides an opportunity to see language development in diachrony.

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Rezyume: Ushbu maqolada XX asr oxiri XXI asr boshlarida qoraqalpoq tiliga boshqa tillardan o'zlashtirilgan o'zlashma so'zlar haqida so'z boradi. Morfologik-semantik aloqalar ham tilga olinadi.

Резюме: В данной статье говорится о заимствованных словах, которые были заимствованы из других языков в каракалпакский язык в конце XX начале XXI века. Также упоминаются морфолого-семантические связи.

Kalit so'zlar: o'zlashtirilgan so'zlar, morfologiya, semantika, qoraqalpoq tili, chet tili, leksik birlik, grammatik kategoriya, ot, so'z, tilshunoslik.

Ключевые слова: заимствованные слова, морфология, семантика, каракалпакский язык, иностранный язык, лексическая единица, грамматическая категория, существительное, слова, лингвистика.

USE OF SOFTWARE TOOLS IN TEACHING MATHEMATICS

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Summary: *The concept of the methodology of teaching mathematics and the use of software tools in teaching mathematics are discussed in this article.*

Key words: *mathematics, methodology, pedagogical technologies, software tools, test, teacher, virtual environment, network, aesthetic.*

The role of mathematics has expanded more in the current period of rapid development of scientific technology, therefore mathematical education has become socially important. In recent years, the entire system of teaching mathematics in secondary schools in our country has undergone changes that are extremely large in terms of their scope and importance.[1.5]

The declaration of education as a priority in the field of social development of our country by the Law of the Republic of Uzbekistan "Ta'limto'g'risida" in 2020 (September 23) imposed many responsible tasks on the sciences of pedagogy and methodology. The introduction of fundamentally new goals to the school led to a radical change in the content of teaching mathematics. The methodology of teaching mathematics provides recommendations for students to acquire theoretical knowledge, to be able to apply the acquired knowledge to solve various practical problems, and to develop thorough skills in students. Also, in order to be more effective in teaching mathematics, the issues of how to organize children's study activities are revealed in the methodology.[1.13]

In the modern science of mathematics, the use of practical software tools specialized in this science is very important, because such software tools allow to quickly and accurately solve problems related to the science of mathematics and to fully understand their meaning. The purpose of teaching this information is to form and develop appropriate skills and competencies for each future specialist to have modern knowledge of the use of applied mathematics, computer science and information technologies, which are necessary to use in their professional fields, and to use them effectively. [2.16]

A number of practical software tools, their types and classifications, user's practical software, automated workplaces, principles of specialized software tools, their main types, and practical software tools used to solve mathematical problems, programs designed to perform specific calculations and others are available to achieve such goals. [3.58] In particular, we found it necessary to discuss the use of software tools in teaching mathematics.

Pedagogical software tools are didactic tools designed for partial or full automation of the learning process with the help of computer technologies. They are considered one of the promising forms of increasing the efficiency of the educational process and are used as a means of teaching modern technologies. Pedagogical software tools include: a software product (set of programs) aimed at achieving specific didactic goals in this subject, technical and methodical support, additional auxiliary tools.

Pedagogical software tools can be divided into as follows:

➤ training programs - based on the level of knowledge and interests of students, they guide them to acquire new knowledge;

➤ test programs - used for checking or evaluating acquired knowledge, skills and abilities;

➤ exercisers - serve to repeat and strengthen previously prepared educational material;

➤ programs that form a virtual learning environment with the participation of the teacher.

There are a number of requirements for creating pedagogical software tools. There are a number of positive factors that confirm their superiority over traditional tools in order to implement the technology of creating pedagogical software tools. These factors can be divided into didactic, psychological, economic, and physiological groups.[4.115]

Didactic requirements for pedagogical software tools include: scientific character, comprehensibility, strict and systematic description (ensuring the possibility of constructing the content of educational activities, taking into account the basic principles of pedagogy, psychology, computer science, ergonomics, the fundamental foundations of modern science), continuity and integrity (previously studied logical consequence and completion of knowledge), consistency, problematic, demonstrativeness, activation (independence of teaching and presence of the characteristic of activity), consistency of extension of teaching results, interactivity of communication, unity of teaching, education, development and practice.

Methodological requirements include: consideration of the specific characteristics of a particular academic subject, consideration of the uniqueness of a specific subject, its interrelatedness, diversity and implementation.

Psychological requirements include the following: perception (verbal-logical, sensory-perceptive), thinking (conceptual-theoretical, demonstrative-practical), attention (persistence, transference), motivation (active forms of work, high degree of visibility, timely continuous stimulation of high-level motivation of students with the help of feedback), taking into account memory, imagination, age and individual psychological characteristics (consideration of the acquired knowledge, skills and qualifications, the content of academic subjects and the level of complexity of educational issues match the age capabilities and individual characteristics of students, protection from being affected by excessive emotional, nervous, mental loads during learning material).

Technical requirements include personal computers and their peripherals, test resources.

Network requirements include "client-server" architecture, Internet navigators, network operating systems, telecommunications, management tools (individual and collective work of the educational process, external feedback).

Aesthetic requirements include: orderliness and expressiveness (elements, location, size, color) functional function of decoration and compatibility with ergonomic requirements.

Special requirements include: interactivity, focus on purpose, independence and flexibility, converting to audio, visualization, access control, intellectual development, differentiation (classification), creativity, openness, feedback, functionality, reliability.

Ergonomic requirements include: adaptation to the user, organization of screen forms.

Methodological requirements include the unique features of the educational subject, its laws, research methods, and the possibilities of introducing modern methods of information processing.

Pedagogical software tools created from subjects must meet the following methodological requirements:

1. Pedagogical software tools should be built based on the interdependence of conceptual, figurative and moving components of presentation of educational material.
2. Pedagogical software tools should provide learning material in the form of a high-order structure and take into account the logical interconnection between disciplines.
3. Pedagogical software tools should provide opportunities to determine whether the learner has mastered the learning material step by step, based on the implementation of various controls.

Functional and psychophysiological capabilities of students must be taken into account in the formation of students' independent learning skills and qualifications based on the use of pedagogical software tools. Educators' desire to cover as much information as possible on the basis of pedagogical software tools can lead to excessive fatigue of the student.[5.80]

On the other hand, increasing the speed of data transfer leads to a decrease in the quality of data transfer, an increase in the number of errors, and a negative impact on the student's well-being and health.

Physiological-hygienic research shows that the mental capacity of computer learners varies inversely proportional to the amount of information being processed.

This is explained by the following reasons:

-increasing the pressure on the organs of vision;

- the loss of the initial mental expectation that occurs when receiving news;
- accumulation of negative emotions due to possible uncertainty and errors;
- the reception of a large amount of educational resources prevents the active acquisition of further information resources. This situation creates the need to develop and implement pedagogical software tools in the educational process, taking into account the necessary didactic, psychophysiological and methodical requirements.[5.56]

In conclusion, the use of software tools in teaching mathematics is determined by the psychophysiological effectiveness of software tools, students' acquisition of educational materials, education and intellectual development, performance indicators, motivational stability levels, and secondly, it is related to the teacher's activity and is rationally determined with teaching concepts, pedagogical technologies, the indicators of rational use of educational tools, teacher's stable motivation and ability to work.

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Rezyume: *Matematika o'qitish metodikasi tushunchasi va matematika o'qitishda dasturiy vositalardan foydalanish ushbu maqolada ko'rib chiqiladi.*

Резюме: *В статье рассматривается понятие методики преподавания математики и использование программных средств при обучении математике.*

Kalit so'zlar: *matematika, metodika, pedagogik texnologiyalar, dasturiy vositalar, test, o'qituvchi, virtual muhit, tarmoq, estetika.*

Ключевые слова: *математика, методика, педагогические технологии, программные средства, тест, учитель, виртуальная среда, сеть, эстетика.*

**ADMINISTRATIVE AND LEGAL METHODS OF PROTECTING THE RIGHT TO
ENTREPRENEURIAL ACTIVITY IN THE REPUBLIC OF UZBEKISTAN**

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Summary: *This article is devoted to methods of administrative and legal protection of rights to entrepreneurial activity in the Republic of Uzbekistan and the role of authorized bodies in protecting the legitimate interests of citizens in the business sphere.*

Key words: *The right to protection, ways to protect, administrative appeal system*

The right to protection in the field of entrepreneurial activity allows entrepreneurs to restore their violated rights. They are endowed with this right on an equal basis with other subjects of legal relations regulated by the norms of constitutional, administrative, civil, and criminal legislation.

Entrepreneurs can exercise their rights in certain ways. Let's consider the main procedural methods of protecting the rights of an entrepreneur.

Appeal to the competent authority to protect the rights and interests of entrepreneurs.

This is the Commissioner for the Protection of the Rights and Legitimate Interests of Entrepreneurs. In accordance with Article 3 of the Law of the Republic of Uzbekistan "On the Commissioner under the President of the Republic of Uzbekistan for the protection of rights and legitimate interests of business entities": The Commissioner under the President of the Republic of Uzbekistan for the protection of the rights and legitimate interests of business entities is an official who provides guarantees for the protection of the rights and legitimate interests of business entities, compliance with these rights and legitimate interests by government bodies, including law enforcement and regulatory authorities [1]. He exercises his powers independently of state bodies and their officials and in his activities is accountable to the President of the Republic of Uzbekistan.

The Commissioner for the Protection of the Rights of Entrepreneurs has the right to study the strict implementation of legislation on compliance with the rights and legitimate interests of business entities by state bodies; announce in writing to government officials and other organizations warnings about the inadmissibility of violating the legislation on observing the rights and legitimate interests of business entities; make submissions to the heads of state bodies and other organizations on the elimination of identified violations of the law, causes and conditions, facilitating them, obligatory for execution within the established time limits; apply to the courts with statements, claims and complaints in the interests of business entities without paying state fees; take part in meetings of government bodies related to the consideration of issues of protecting the rights and legitimate interests of business entities; draw up protocols on administrative offenses regarding violations of the law that entail administrative liability.

By the Decree of the President of the Republic of Uzbekistan "On measures to radically improve the system for protecting business activities and optimizing the activities of the prosecutor's office" dated March 15, 2019. No.5690 in order to strengthen the legal mechanisms for protecting the rights and interests of business entities, ensuring guarantees of legality in their activities, improving the investment climate and business environment in the republic, as well as optimizing the activities of the prosecutor's office by eliminating tasks and functions unusual for them from April 1, 2019 coordination of inspections of the activities of business entities and control over the legality of their conduct by regulatory authorities is carried out by the Commissioner under the President of the Republic of Uzbekistan for the protection of the rights and legitimate interests of business entities [2].

The decisions of the Commissioner for the Protection of the Rights of Entrepreneurs regarding the conduct of inspections of the activities of business entities are mandatory for execution by regulatory authorities. The Unified System for Electronic Registration of Inspections

was transferred from the jurisdiction of the General Prosecutor's Office of the Republic of Uzbekistan to the Commissioner for the Protection of the Rights of Entrepreneurs.

This Decree defines the powers of the Commissioner for the Protection of the Rights of Entrepreneurs. He has the right to: exercise control over compliance by regulatory authorities with legal requirements in the field of conducting inspections of the activities of business entities; take measures to bring to justice guilty officials of regulatory authorities for violating legislation in the field of conducting inspections of the activities of business entities; provide advisory support to regulatory authorities and business entities regarding the application of legislation in the field of inspections of the activities of business entities; participate in the development and improvement of the regulatory framework in the field of conducting inspections of the activities of business entities and others [3].

According to Decree of the President of the Republic of Uzbekistan dated August 13, 2019 “On additional measures to strengthen the protection of private property and guarantees of the rights of owners, radically improve the system of organizing work to support entrepreneurial initiatives, as well as expanding access of business entities to financial resources and production infrastructure” The General Prosecutor's Office and the Commissioner under the President of the Republic of Uzbekistan for the protection of the rights and legitimate interests of business entities have been instructed to establish systemic supervision (control) over the inadmissibility of causing damage to private owners by violating their rights, including illegal restrictions and (or) deprivation of property rights, encroachment on private property, including previously privatized, imposing obviously unacceptable conditions on the owner, including unreasonable demands for the transfer of property or property rights, as well as confiscation of property or forcing him to renounce the right to his own property; take the necessary measures to prevent and prevent abuses and violations of the law by officials.

The implementation of methods for protecting the rights of entrepreneurs also occurs in certain forms, which represent the process of applying legal norms, the result of which is the recognition of the right, the suppression of actions that violate or create a threat of violation of the right. This is, first of all, a judicial form of protection of the rights of entrepreneurs, which is based on the activities of state-authorized bodies for the protection of violated or disputed rights, to which an entrepreneur turns in the event of a violation of his legal rights and interests by unlawful actions.

Since its inception, our state has been going through a process of constant reform, aimed, among other things, at ensuring guarantees of the rights and freedoms of man and citizen. The reforms are based on modern ideas about how the relationship between the government and the individual, the state and society, the administrative apparatus and business should be built.

In the theory of administrative law, a set of rules that determine the grounds and procedure for consideration by the court of disputes between a citizen and the state are traditionally combined into the institution of administrative justice. When considering such disputes, courts not only resolve individual legal conflicts and restore the violated rights of the party who applied to the court, but also check the legality of the activities of executive authorities. Thus, administrative justice acts as a special mechanism of judicial control over the sphere of management.

Judicial control over the activities of government bodies and the possibility of seeking judicial protection in the event of a violation of the subjective public rights of a person involved in the public legal sphere stems from the constitutional right to appeal the actions of government bodies, public associations and officials, established by Article 55 of the Constitution Republic of Uzbekistan [4]. It is the judiciary, independent and impartial by nature, that plays a decisive role in the state protection of the rights and freedoms of man and citizen, and it is the court that finally resolves a dispute about the law. The judicial authorities, by virtue of the Constitution and laws, are vested with the authority to exercise judicial control over the activities of government bodies when they make legally significant decisions by resolving public law disputes.

The powers to administer justice through administrative proceedings in accordance with current legislation are vested in administrative courts. Presidential Decree No.4966 dated February

21, 2017 «On measures to radically improve the structure and increase the efficiency of the judicial system of the Republic of Uzbekistan [5]» Administrative courts were created in the country for the first time in history, although their competence was initially mixed: both administrative disputes and cases of administrative offenses were included in their jurisdiction. However, three years later, by Presidential Decree No.6034 of June 24, 2020 “On additional measures to further improve the activities of courts and increase the efficiency of justice,” a decision was made to reform administrative courts [6], and a little later, by Law No.665 “On Amendments and Additions to the Code of Administrative Responsibility” dated January 12, 2021, cases of administrative offenses were transferred to the jurisdiction of criminal courts [7].

According to Article 26 of the Code of the Republic of Uzbekistan on administrative proceedings dated January 25, 2018, the administrative court has jurisdiction over cases on the protection of violated or contested rights, freedoms and legitimate interests of citizens and legal entities arising from administrative and other public legal relations, with the exception of cases assigned to the jurisdiction Constitutional Court of the Republic of Uzbekistan, civil courts, economic courts and military courts.

Cases resolved by administrative courts include:

- 1) on challenging departmental regulations;
- 2) on challenging decisions, actions (inaction) of local government bodies, government bodies, other organizations authorized to carry out administrative and legal activities, self-government bodies of citizens and their officials that do not comply with the law and violate the rights and legally protected interests of citizens or legal entities persons;
- 3) on challenging the actions (decisions) of election commissions;
- 4) on challenging the refusal to perform a notarial act, registration of civil status records or actions (inaction) of a notary or an official of a civil registration authority;
- 5) on appealing the refusal of state registration or evasion of state registration within the prescribed period;
- 6) on investment disputes;
- 7) about competition;
- 8) on appealing an executive or other document, according to which collection is carried out in an indisputable manner, according to requirements arising from administrative and other public legal relations.

The court also resolves other cases on the protection of violated or disputed rights, freedoms and legitimate interests of citizens and legal entities arising from administrative and other public legal relations, referred by law to its competence [8].

In connection with these norms of the Code of the Republic of Uzbekistan on administrative proceedings dated January 25, 2018, entrepreneurs can appeal to administrative courts against illegal acts and actions of executive authorities that violate their rights.

Another way for entrepreneurs to protect their rights is the administrative appeal system. However, as means of protecting the rights of a private individual from administrative arbitrariness, an administrative complaint has somewhat lost the trust of citizens and business entities.

One of the reasons for this is the lack of an administrative procedure for considering administrative complaints.

Before the adoption of the Law of the Republic of Uzbekistan «On Administrative Procedures [9]» such complaints were considered as appeals on the basis of the Law of the Republic of Uzbekistan “On appeals from individuals and legal entities” [10]. However, this procedure could not fully ensure high-quality impartial consideration of administrative disputes. Thus, according to the Supreme Court, not a single administrative dispute that was considered by administrative courts in 2019 first went through the pre-trial appeal procedure to a higher administrative authority. Interested parties prefer to go straight to court, neglecting the right of administrative complaint. The reason for this is the low level of trust of stakeholders in administrative bodies in general, including higher administrative bodies [11].

In this regard, one of the possible ways to develop the administrative appeal system is the creation of departmental jurisdictional structures in executive authorities that specialize in the consideration of administrative complaints.

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Rezyume: Ушбу мақола Ўзбекистон Республикасида тадбиркорлик фаолиятига бўлган ҳуқуқларни маъмурий-ҳуқуқий ҳимоя қилиш усуллари ва тадбиркорлик соҳасида фуқароларнинг қонуний манфаатларини ҳимоя қилишда ваколатли органларнинг аҳамиятига бағишланган.

Резюме: Данная статья посвящена способам административно-правовой защиты прав на предпринимательскую деятельность в Республике Узбекистан и роли уполномоченных органов в осуществлении защиты законных интересов граждан в предпринимательской сфере.

Rezyume: Ҳимоя қилиш ҳуқуқи, ҳимоя қилиш усуллари, маъмурий шикоят қилиш тизими

Ключевые слова: Право на защиту, способы защиты, система административного обжалования

THE DEVELOPMENT OF THE UZBEK LITERARY LANGUAGE AFTER THE 12th CENTURY

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Summary: The article talks about the stages of development of the Uzbek literary language after the 12th century. Analytical opinions are given about the literary language of the Chigatai tribe and the literary language of the Golden Horde state.

Keywords: literary language, stages of development, Chigatai language, Golden Horde, dialect.

Historical events of the XIII-XIV centuries have a great role in the development of the Uzbek literary language since the XII century. It is known that the activity of Mongolian tribes increases from the 10th century. Karakhitays, who are one of their tribes, invaded Central Asia in the middle of the 12th century. Here they have to fight from both sides. On the one hand, with the state of Khorezmshah, and on the other hand, with the Naymans from the Mongol clans. The Khorezmshahs use the nomadic Kipchaks and Oghuzs in this struggle and suppress the Karakhanis. But they left behind a clan called China in Central Asia, in particular, the Uzbek population. At the beginning of the 13th century, the Mongol invasion of Central Asia began.

V. Bartold said that this historical event also affected the language of the state established in Central Asia, and its language was officially Turkish. The state created as a result of the Mongol invasion was known as the Khigatai state and lasted until the end of the 14th century when the Timurid Empire was established. The Chigatai state was established in the territory inhabited by tribes and peoples with Turkic and Iranian language and culture, and created its own written literary language, which served as a base for the old Uzbek literary language during Navoi's time. The literary language called Chigatai language is recognized in scientific literature as a result of the continuation and development of the Qarluq-Chigil-Uyghur and Western Khorezm (Oghuz) languages formed during the Karakhanids.

Due to the fact that the literary language of the 12th-14th centuries was based on the language of the Karakhanid era, the "d" in the language is becoming. In the 13th century, under the influence of the Mongolian tribes, the process of the transition of the Khorezm population to the Turkic language was completed. At the end of the 13th century and the beginning of the 14th century, the Turkic-speaking population increased not only in the villages and desert regions, but also in the large cities of Central Asia and Kashgar. This made it necessary to turn to the living vernacular language in fiction literature. Together with this, the Golden Horde state was formed, which included Khorezm in the XIII-XIV centuries. In Khorezm, which was a part of the Golden Horde, the literary language developed on the basis of elements of the Kipchak-Oghuz language. The influence of the Golden Horde on Movarounnahr increased through Khorezm.

As a result, political and economic relations between the central part of Central Asia and Kashkar were severed by the 14th century. The development of the Uzbek language was influenced by the attitude of sedentary and nomadic tribes. Nomadic Uzbeks under the leadership of Uzbek Khan marched to Movarounnahr several times at the beginning of the 14th century. These marches intensified again during the period of Abul Khair Khan and Shaybani Khan. Under the influence of the nomadic Uzbeks, the process of transitioning to the dialect with the addition of "y" instead of the "d" dialect intensified. So, kipchak elements began to occupy a significant place.

Also, the influence of the Oguz tribes to the west, north-west of Movarounnahr and southern Khorezm began to increase. The Oghuzs also spoke in a "y" dialect. As a result of this historical process, the "d" that existed in the ancient Turkish language, reflected in the monuments of the X-XII centuries, and became the tradition of the book language of the XII-XIV centuries, was influenced by the tradition of the Western literary language (Khorazm) of the XIV century. "y"

began to fade. This situation is also found in the language of "Oguznoma" and other works of the Golden Horde cycle. On the contrary, the Karaluq-Chigil-Uyghur language had an influence on the Western Turkic languages. This influence was strong until the Mongols, and with the decline of the eastern literary language, the development of the western literary language, or in the words of N.A. Baskakov, the literary language of the Qarluq-Khorazm began. According to N.A. Baskakov, the Qarluq-Khorazm literary language was the basis for the creation of the old Uzbek literary language.

After the end of the rule of the Karakhanid state, the Qarluq-Khorazm literary language appeared in Khorezm. This language caused the emergence of two closely related literary languages after the Mongol conquest. One of them is the literary language of the Golden Horde or Khorezm, and the other is the language of the Khigatai tribe. As a monument of the literary language of Karaluq-Khorazm, it is possible to show such works as "**Kissasul-anbiyya**" by Rabghozi, "**Qissai Yusuf**" by Ali, "**Devoni Hikmat**" by Ahmed Yassavi. Here we will get acquainted with the linguistic features of the work "**Qissasul Anbiyo**".

After the Mongol invasion in the 13th century, the Chigatai state was established in Movarounnahr. It refers to the literary language of the Karakhanid period and the literary language of Khorezm in the conduct of public office affairs. But more importance was given to the language of the Korakhoni period. To a certain extent, this situation caused the features of the Qarluq-Uyghur language to be absorbed into it, because the Uyghurs are a culturally superior tribe, and during the Mongol rule, they were involved in the cultural life of the state and related to writing. He played an important role in almost all of his affairs. Children of officials in the palace were educated by Uyghurs. In the monuments of the literary language of the Chigatai tribe, we see the consonants z, y in place of the ancient book d. Also, some of them have features of the Turkmen language, and some of them have features of the Uyghur language. As monuments of the literary language of the Chigatai people, it is possible to show such works as "**Mukaddimat-ul Adab**", "**Yusuf and Zulayha**", "**Ravnaq-ul Islam**", "**Oguznoma**".

The literary language of the Golden Horde developed under the influence of the Qarluq-Khorazm literary language. That is why monuments belonging to the Golden Horde cycle are also referred to as Khorezm Memoirs in many literatures. The literary language of the Karakhanid era, Oghuz, and Kipchak elements were mixed in the monuments of Khorezm, thereby enriching the graphic structure and lexicon of the national language. Khorezm monuments do not have a common literary norm. Depending on the place where the work was written, the phonetic grammar and lexicon have their own characteristics. For example; In works such as "**Muhabbatnama**" and "**Nakhul Farodis**" elements of Oguz and Kipchak are mixed, "**Khisrav and Shirin**" and "**Merojnoma**" (about the journey of the Prophet Muhammad from Mecca to Jerusalem and his exit from Jerusalem to the sky) noma) we can see the mixed use of Oghuz, Kipchak and Korakhani languages. One of the most characteristic monuments of the literary language of the Golden Horde is Qutb's epic "**Khisrav and Shirin**".

Until now, there is no exact information about when and where "Oguznoma" was copied, which is considered an ancient relic of the Turkic peoples of Central Asia - the Oghuz and Qarluq-Uyghur dialects. It is reported that N.M. Mallaev read this work in the 13th-14th centuries, and A.M. Sherbak in the 15th century. Based on the analysis of the language features of "Oguznoma", the German scientist V.Bang tentatively calls the language of the legend a new Eastern Turkic language and puts forward an opinion that is very close to P.Pellio's opinion. A.M. Shcherbak, based on the study of various manuscripts of "Oguznoma", comparing its language with other works, comes to the following conclusion: the language of the original manuscript is written in a "singing" dialect, and the phonetic formation of the root of the word has unlabialized sounds. participates more. The work was written in Turfon (Kashkar) at the end of the XIII century and the beginning of the XIV century. The strengthening of the principle of unification of tribal unions, as a result of which, in addition to the features of the Qarluq, Uyghur, and Oghuz languages, which have become more rigid, Kipchak elements, which have entered later, are also reflected in the language of the work. All these dialects together form the basis of the old Uzbek language. The work depicts

terrible conquests and wars along with mythological legends created in ancient times. This may be a reflection of Genghis' conquest. The Mongolian elements in the language of the work also indicate this. In the language of the work, we find features of the Qarluq-Uyghur, Oghuz tribal union. In the language of legend, we see the use of back vowels after high-narrow vowels: *adug*, *tirig*, *tag`* and *kh.o*. In fact, relatively new phonetic, lexical and grammatical features are found in the language of "Oguznoma". For example, one can see the phenomenon of the dominance of the sound *y* compared to *d*, *dz* in the word: *adg`ir*, *qon* is used instead of *ayg`ir*, *qoy*.

But this situation is not yet fixed, their parallel use is also found: such as *ayg`ir*, *adug* (*ayiq*). The harmony of vowels has been completely preserved: from *urungudun*, the thighs (door) have been removed from *tzmurdun*. Consonants have a strong phenomenon of detonation: *atni keldurdi*. *Tan erte boddukta*. At the end of the word, after narrow and wide vowels, the tongue is back **g`**, **g** sounds are saved: *tirig*, *olug*, *tag`*, *adug`*. In the 1st person of the personal pronouns, the consonant **b** comes in the form of **m**: *baluqni (shahar) benga saqlab kelgil*. *Menge atam bu baluqn`!* *Berub turur*. **-n`ñ**, **-nuñ** types of the indicative are more common: such as *bəshin əgulm*, *og`uz qag`anniñ ati*, *anuñ bashi*, *qagannuñ chərigi*. The work does not use the old form of the accusative **-ig`**, **-ig** affixed, or the form formed by the affix **-i/-n**, **-i/-n**. Adjectives with the affixes **-duk**, **-duk**, **-g`u**, **-gü** are found in the work: *yibarguda erdi*. Such as *Urushg`udun son*. *Og`uz kərdyktə əzi kətti*. The second of the ordinal numbers (in the second place), *ychynchy*, *ychynchi* (*ychynch* place forms are used. The conditional verb comes mainly with the affix **-sa** (instead of **-sar**): to the first *Kun at qoyd`shar*, to the second such as *Ay at qayd`shar...*, *kulsm*, *yshlasa*.

These facts show that the features of the Qarluq-Uyghur language are dominant in the work. A number of Mongolian words found in the language of Asar form a new lexical layer that entered Turkic languages in those times. The language of the work "Oguznoma" differs from the old Uzbek literary language only by some features, it is closer to the traditions of the Qarluq Uyghur language. So, through the language materials of the work "Oguznoma", it is determined that the old Uzbek literary language is closely related and inextricably linked with the Qarluq-Chigil-Uyghur language unit. **d-y** sounds are exchanged between words;

*adug-ayug`* Total number: **-egu**, **uch egu**, **ik egu**, **beshe egu**. Action name: **-ish/-ish/-sh** affixes and h.o. In the language of legend, in the monument of the 10th-12th centuries, the accusative case **-ig`/ig** I of the weapon case with the affixes **-in/-n**, etc. forms are found. The above facts give full opportunity to consider the work "Oguznoma" as a 13th-14th century monument as an example of the literary language of that period.

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Rezyume: *Maqolada 12-asrdan keyingi o'zbek adabiy tilining rivojlanish bosqichlari haqida so'z boradi. Chig'atoy qabilasi adabiy tili, Oltin O'rda davlati adabiy tili haqida tahliliy xulosalar berilgan.*

Резюме: *В статье говорится об этапах развития узбекского литературного языка после XII века. Даны аналитические заключения о литературном языке племени Чигатай и литературном языке Золотоордынского государства.*

Kalit so'zlar: *adabiyot til, taraqqiyot bosqichlari, chig'atoy tili, Oltin O'rda, dialekt.*

Ключевые слова: *литература, язык, этапы развития, чигатайский язык, Золотая Орда, диалект.*

ON SOME MATTERS OF WORD FORMATION IN LINGUISTICS.

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Summary: *The article presents arguments for the place of word formation in modern linguistics. It discusses the process of formalizing the theory of word formation as an independent science requires a new approach to some concepts in this field*

Key words: word-forming tools, typological analysis, different approach, language system, conversion

The theory of word formation in the system of linguistic sciences has long been a source of controversy for all linguists. Word formation has been included by linguists sometimes in the field of morphology, sometimes in the field of lexicology.

The opinion expressed by V.V. Vinogradov about the role of word formation in linguistics is instructive. According to him, while word formation is of great importance in the science of linguistics, it approaches lexicology - the science of the vocabulary of the language, and grammar - the doctrine of form formation and the syntax of word combinations. is also related to The number of supporters of this point of view is increasing day by day.

Currently, the process of formalizing the theory of word formation as an independent science requires a new approach to some concepts in this field, detailed confirmation of some word formation tools, and the development of analysis methods relevant to this field. [1].

Although sufficient attention is paid to the ways and means of word formation in each language, comparative study of this issue has been done relatively little. Even in well-studied languages, word-forming tools have not been fully expressed. In addition, the work carried out in this field using different research methods, with different goals and different approaches to the studied phenomenon, makes it difficult or impossible to compare the research results for a certain language group.

Problems of typological analysis mainly arise in the study of morphological features of different languages. Other aspects of the language structure have been relatively little studied from this point of view. For example, the study of universal phenomena in the field of lexis and semantics is at the first stage. "Despite the existence of specific lexical content, it is necessary to determine whether there are general lexical-semantic models characteristic of several language groups. If there are, it is necessary to include their laws and characteristics". The main task of typological research is to establish a relationship of models common to each language system.'[2].

During the investigation of word formation, we can see that as the typological similarity of languages is clearly visible in this area, their differences are also clearly visible. As a confirmation of this opinion, the results of research conducted on five Slavic languages and three Germanic languages can be cited.

Since English and Russian belong to Indo-European languages, it is natural that they have many similar features in word formation. But at the same time, the relationships between the individual word-forming tools of the above-mentioned languages have different characteristics, the existence of unique word-formation methods, and the level of productivity of one or another word-formation method in each language. It is distinguished by its individuality.

There are mainly morphological, morphological-syntactic, lexical-semantic and lexical-syntactic methods of word formation. One of the most productive methods of enriching the lexicon of the modern English and Russian languages is the morphological method of word formation. This method is done by adding affixes and adding words and making words without affixes. In the formation of words without affixes, it is carried out by the exchange of sounds and the transfer of stress as a means of word formation. But this way of making words is not widespread. It is especially observed when forming nouns from verbs and adjectives.

For example: Russian. svistet - whist, zvat - zov, glukhoy-glush, tihiy - tooth; visual to lose-loss, to bleed-blood, to live-life, to ob'ject-'object, to present'sent-'present.[3].

The method of word formation without affixes can include conversion, which is common in English, that is, the method of word formation by moving a given stem to another paradigm of word change. In this case, due to the change in the syntactic combination of the new word, conversion requires a morphological-syntactic method of word formation. Most of the words formed by conversion are verbs: chair - to chair, light - to light, free - to free, wet - to wet, down - to down, etc. From the examples given above, it can be seen that verbs can be formed from different word groups, that is, from nouns, adjectives and adverbs. With the help of conversion, other word groups can be formed, for example, a noun: to run - run, to work - work, native - a native, etc. The phenomenon of conversion is one of its characteristics that distinguishes English from Russian [4].

Affixation and word addition are the most universal means of word formation in the languages under consideration. Affixation is the formation of a word by adding one or another word-forming agent to the stem. There are three types of word formation using affixes: using suffixes, using prefixes, and using suffix-prefixes.

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Rezyume: Maqolada so‘z yasalishining zamonaviy tilshunoslikdagi o‘rni haqidagi dalillar keltirilgan. Unda so‘z yasalishi nazariyasini mustaqil fan sifatida rasmiylashtirish jarayoni bu sohadagi ayrim tushunchalarga yangicha yondashuvni taqozo etadi.

Резюме: В статье представлены аргументы в пользу места словообразования в современном языкознании. В ней рассматривается процесс формалрования теории словообразования как самостоятельной науки, требующей нового подхода к некоторым понятиям в этой области

Kalit so‘zlar: so‘z yasash vositalari, tipologik tahlil, turlicha yondashuv, til tizimi, konversiya

Ключевые слова: словообразовательные средства, типологический анализ, иной подход, языковая система, конверсия.

THE ROLE OF APPLIED ART IN ART DECORATION WORKS

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Summary: *In this article, the origin, place and level of the types of folk art and the methods of their artistic decoration are shown, and it is proved with the help of the necessary literature. Since then, it is a true art form that has been refined over the centuries, and most importantly, it has survived to this day.*

Keywords: *folk art, artistic decoration, student, spirituality, color, pattern.*

Today, it is the duty of all of us living in your country to preserve our nationality, values and traditions. We should preserve our values that are dear to our past, our nation, and our people, and as young specialists, we should be able to instill these concepts into the minds of students. In fact, human creative activity is an important factor in its all-round development, and it cannot be imagined without aesthetic perfection. Human life is surrounded by objects and objects. Colorful objects and objects give beauty and sophistication to existence, and encourage people to look at these laws.

April 21, 2020, PQ-4688 of the President of the Republic of Uzbekistan, Sh.M. Mirziyoyev, in order to further increase the efficiency of the field of visual and applied art and design in our country. On the events of The importance of stylization of natural elements in providing artistic information to young people is extremely important, which is important in developing their general outlook. It aims to learn practical art, develop the skills of drawing, painting and decorating simple patterns. Fundamentally reforming the existing education system, raising it to the level of modern requirements, establishing a new system of national personnel training, and educating a mature and capable generation for the future are among the important tasks.

Therefore, our main task is to develop students' knowledge about our spirituality, our past, traditions and values. Artistic culture has been formed in our country in a unique way. It reflected the unique aspects of folk art. Crafts such as coppersmithing, pottery, textiles, embroidery, and carpet weaving have developed.

Folk decorative art is definitely a craft. It is a masterpiece of folk decorative art that has been carefully preserved by our ancestors for centuries. In history and in our time these types of applied arts, which are preserved, will be more appreciated and honored in the future. Because unique patterns carved, drawn, and painted are an expression of a person's perception of the beautiful idea, human feelings. In applied decorative arts, colors that are close to each other in brightness and hue are usually combined, so when colorful colors are combined through mutual hues, they stand out.

Color (Italian *colonia*, Latin *color* - color, paint) is the interproportion of colors in the realistic and expressive depiction of reality in works of visual and applied art. The interrelationship between harmonious, beautiful color combinations of different colors in the image is called "colorite". The idea and content of a colorful work of art, which is a component of an effective representation of reality. depends on the style of the period and the author's comment. Historically, local colors were more or less limited in the representation of reality, more symbolic colors were used (in the art of the Middle Ages) and a tradition of colorful representation of reality in all colors (using its color, hue, light shade, etc.) was formed. According to the harmony of colors, warm (red, yellow, yellow) or cold (blue, green, purple), calm and serious, light or dull, according to the color, bright, dim and others possible Color reveals to us the richness, color and beauty of the world. It is important to note that the right combination of colors in the image creates the basis for the development of knowledge of the beauty of an elegant work, along with the ability to understand beauty.

Applied art, applied decorative art - the field of decorative art; creative work fields related to the preparation of artistic objects of practical importance in social and personal life and the artistic processing of daily life items (tools, furniture, cloth, work tools, clothes, jewelry, toys, etc.) includes. In practical art, artistic decoration techniques are carried out with their necessary tools, firstly, the raw materials for decoration are polished and drawn, and then work is carried out in sequence. An elegant pattern is drawn on the smoothed raw material, for example (axta, cotton, almond, pomegranate flower).

Our ancestors decorated their dwellings, walls, stones, and dishes with images of hunting, battles, parties, inscriptions, ceremonies, various animals, birds, and plants. In addition, in order to further increase the effectiveness of the decoration, they expressed the wisdom of the people, the advice of the great scholar, in various symbolic meanings.

Before painting the pattern, the finished paint is tested by smearing it on white paper. Only if the prepared color meets the requirements, the necessary areas are painted with it. Then an ink pen is considered the thinnest pencil, and with its help, the edges of the pattern elements are smoothly drawn with the same thickness. With the help of targil - the various characteristics of flower, bud, and leaf elements are revealed with the help of comb quality forms.

Pattern means image, flower in Arabic. It is an ornament created by repetition of bird, animal, plant, geometric and other elements in a certain order. Patterns are worked in various ways in needlework, carving, embroidery, goldsmithing, pottery, jewelry, carpet weaving, textiles, fences, etc.

Works of applied art are designed to be seen, felt and understood. Practical works of art and objects serve to beautify and enrich the material nature of a person, at the same time, their appearance and structural characteristics affect the mental state and mood of a person. is also appreciated for. Therefore, showing the beauty and elegant properties of raw materials, the skills and methods of processing them are important active tools that increase the aesthetic effect in practical art. In practical art, the elegance of objects is achieved in two ways:

- 1) the artistic value is increased by decorating ordinary objects;
- 2) the shape is beautifully processed.

The structure of objects plays an important role in the processing of art objects. The beauty of the raw material, the proportion of the parts, the elegance of the structure is the only means of expressing the impressive overall image of the item. The decoration created on the item has a significant impact on its image structure. Thanks to the decoration, the item becomes a work of practical art. In applied art, parts (individually or in various combinations) of patterns and visual arts (painting, sculpture, and in some cases graphics) are widely used to create decoration.

Painting as a type of folk decorative art has been an important part of Uzbek culture since ancient times. Its artistic traditions have been created and developed over many centuries. In contrast to all other types of art, one can see the close connection of generations, the continuity of national traditions. The traditions of painting have been passed down from grandfather to father and from father to son as methods of learning this type of art. Thanks to this continuity, the art of painting has been preserved until now. The best examples of the pattern are distinguished by the expediency and beauty of the forms combined through a rich creative fantasy. This reflects the difference in views of the folk masters on the environment. Artistic painting is the art of creating beauty in the harmony of colors and unique compositions.

In his work, the master painter skillfully uses the natural luster and harmony of colors, the beautiful shape, and the texture of the material to achieve vivid expression. The rhythmic movement of intertwined branches, branches and luxuriously depicted flowers in a delicate plant-geometric pattern, classical motifs of Uzbek masters' work and girih patterns are adapted to the shape of the ceilings. The pattern serves to decorate more interiors and closed porches and porches. Currently, the pattern is used in architecture, home furnishings, gifts, small wooden toys, musical instruments and household items.

So, in conclusion, it is worth noting that while studying the masterpieces of culture and art of our country, the love for the past ancestors grows stronger, and the feeling of teaching it to the future generation increases. In this way, we become aware of our rich spirituality that has reached us from our ancestors. Studying the art of folk painting serves to develop artistic taste, hard work in students and acquire a number of useful knowledge and skills. It helps to identify and develop their creative abilities and serves as a basis for their learning of this craft.

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Rezyume: *Mazkur maqolada xalq amaliy san'ati turlari va ularni badiiy bezatish usullarining kelib chiqishi, hozirgi kundagi o'rni va darajasi ko'rsatib berilgan va kerakli adabiyotlar yordamida isbotlangan, ma'lumot o'rnida shuni aytish joizki, amaliy bezak san'ati insoniyat yaratilgandan buyon, asrlar davomida sayqallanib kelingan, eng muhimi bugungi kungacha saqlanib qolgan haqiqiy san'at turidir.*

Резюме: *В данной статье показаны происхождение, место и уровень видов народного творчества и приемы их художественного оформления, и доказано с помощью необходимой литературы С тех пор это истинный вид искусства, который совершенствовалась веками, а главное, сохранилась до наших дней.*

Kalit so'zlari: *Xalq amaliy san'ati, badiiy bezatish, o'quvchi, ma'naviyat, kolorit, naqsh.*

Ключевые слова: *народное творчество, художественное оформление, ученик, одухотворенность, цвет, узор.*

**CONSTITUTIONAL FOUNDATIONS FOR THE PROTECTION OF HUMAN RIGHTS
AND FREEDOMS IN UZBEKISTAN**

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*Deputy Chairman of the Senate Committee of the Oliy Majlis of the Republic of Uzbekistan on
issues of development of the Aral Sea region and ecology.*

Summary: *The article discusses the constitutional foundations for the protection of human rights and freedoms in Uzbekistan, specifically focusing on the amendments and additions to the Criminal Executive Code aimed at ensuring the rights and legitimate interests of convicts.*

Keywords: *Constitution, criminal executive code, convict, human rights, legitimate interests*

On April 30, 2023, a referendum was held in the Republic of Uzbekistan, through which the new edition of the Constitution of the Republic of Uzbekistan was adopted by popular vote. Article 13 of this new Constitution states: “Democracy in the Republic of Uzbekistan is based on universal principles, according to which a person, his life, freedom, honor, dignity, and other inalienable rights are considered the highest value.” This principle and similar provisions are reflected in several articles of our Constitution. It is well known that all legal documents need to be reviewed and brought in line with the new edition of the Constitution[1].

In his congratulatory message to our people on the occasion of the Constitution Day of the Republic of Uzbekistan on December 8, our esteemed President Shavkat Mirziyoyev emphasized that, as firmly established in our Constitution, the inviolability of human honor and dignity, as well as the protection of their rights and legitimate interests, are without doubt among our most urgent tasks. He stressed that our primary focus in this area is on introducing effective legal mechanisms to prevent such violations and on improving the activities of national human rights institutions, such as the Ombudsman for Human Rights of the Oliy Majlis, the Children’s Ombudsman, and other national human rights institutions.

The new stage of humanitarian democratic reforms being implemented in Uzbekistan requires the improvement of legislation aimed at ensuring the rights and freedoms of convicts, creating favorable conditions for them, and further improving the conditions of detention from a humanitarian perspective.

The law “On Amendments and Additions to the Criminal Executive Code of the Republic of Uzbekistan [2] to Ensure the Rights and Legitimate Interests of Convicts” and the tasks outlined in the Presidential Decree No. PF-67 dated May 8, 2023, “On Priority Measures to Implement the New Edition of the Constitution of the Republic of Uzbekistan,” [3] specifically in clause 40 of Annex 1, mandate the development of a draft law that introduces norms into the Criminal Executive Code aimed at ensuring humane treatment of persons deprived of their liberty, and the respect for their honor and dignity.

The Constitutional Basis for the Protection of Human Rights and Freedoms in Uzbekistan In the new edition of the Constitution of the Republic of Uzbekistan, adopted on April 30, 2023, by popular vote, Article 28, Part Six, specifies that “persons deprived of their liberty have the right to humane treatment and respect for their honor and dignity inherent to the human person.” Based on this constitutional requirement, the principles of the criminal-executive legislation outlined in Article 6 of the Criminal Executive Code have been supplemented to include: “The criminal-executive legislation is based on the principles of legality, fairness, humanity, democracy, adherence to differentiation and individualized approaches in the execution of sentences, the rational use of coercive measures, the promotion of law-abiding behavior among convicts, humane treatment of convicts, and respect for the honor and dignity inherent to the human person.”

Additionally, Part Four of Article 55 of our Constitution enshrines that “everyone has the right, in accordance with the legislation and international treaties of the Republic of Uzbekistan, to apply to international bodies that protect human rights and freedoms if all legal remedies within the

state have been exhausted.” This provision strengthens the guarantees of human and civil rights and freedoms in Uzbekistan. Based on this constitutional requirement, the following provisions have been added as a new fifth paragraph to the first part of Article 9 of the Criminal Executive Code, which lists the basic rights of convicts.

It is also noteworthy that Part Six of Article 128 of the new edition of the Constitution of the Republic of Uzbekistan states that “persons convicted by a court for committing serious and especially serious crimes can be deprived of their right to participate in elections only in accordance with the law and based on a court decision; in other cases, any direct or indirect restriction of citizens' electoral rights is prohibited.” Based on this new constitutional norm, Article 9 of the Criminal Executive Code, which lists the basic rights of convicts, has been supplemented with appropriate additions, further strengthening the guarantees of the electoral rights of convicts.

Furthermore, Article 26 of the new edition of the Constitution of the Republic of Uzbekistan states that “the inviolability of human honor and dignity is ensured; no one may be subjected to torture, violence, other cruel, inhuman or degrading treatment or punishment; and no one may be subjected to medical or scientific experiments without their consent.” Based on these constitutional norms, the Criminal Executive Code has been supplemented with a new Article 111, “The Right of Convicts to Humane Treatment,” which specifies that convicts have the right to humane treatment and respect for their honor and dignity inherent to the human person. The first part of this article states that convicts have the right to humane treatment and respect for their honor and dignity, the second part mandates that employees of penal institutions treat convicts humanely, the third part prohibits deviations from the grounds and procedures established by this Code when applying disciplinary measures and other coercive measures to convicts, and the fourth part prohibits conducting medical and scientific experiments on convicts without their consent. This significant article was introduced on the recommendation of the Ombudsman of the Oliy Majlis of the Republic of Uzbekistan.

It should be noted that norms related to the right to humane treatment are also present in the criminal-executive legislation of Russia, Belarus, Moldova, Azerbaijan, Kazakhstan, Tajikistan, and Turkmenistan.

Currently, the significance of the Ombudsman institution of the Oliy Majlis of the Republic of Uzbekistan in protecting human rights and freedoms is increasing. The institutional foundations of the Ombudsman's activities are being improved, and the scope of their authority and presence in the regions is expanding. This institution effectively exercises parliamentary control over the observance of legislation on human rights, freedoms, and legitimate interests by law enforcement agencies and takes effective measures to prevent torture and other inhuman or degrading treatment in places of detention. In accordance with Presidential Decree No. PF-6312 dated September 10, 2021, “On Measures to Improve the Activities of the Ombudsman of the Oliy Majlis of the Republic of Uzbekistan,” [4] specific tasks were outlined for developing legal mechanisms for maintaining the “Ombudsman Box” in penal institutions and pre-trial detention facilities, allowing persons deprived of their liberty to place their appeals in these boxes.

Based on the tasks specified in the decree, a new Article 792 has been added to the Criminal Executive Code, stipulating the rules for appeals through the Ombudsman Box to the Ombudsman of the Oliy Majlis of the Republic of Uzbekistan and the Children's Ombudsman of the Oliy Majlis of the Republic of Uzbekistan. The first part of Article 792 specifies that an Ombudsman Box should be installed in a convenient location in each residential sector, industrial zone, and short- and long-term meeting facilities within penal institutions, with an additional box for the Children's Ombudsman in educational colonies. These boxes are to be opened only by the Ombudsman, the Children's Ombudsman, or their staff.

The second part of this article notes that the procedure for installing, using, and sending appeals through the Ombudsman Box is to be approved by the Ombudsman, the Children's Ombudsman, and the Ministry of Internal Affairs of the Republic of Uzbekistan.

The adopted law aims to ensure the humane treatment of convicts, protect their rights, freedoms, and legitimate interests more reliably, and align the criminal-executive legislation with the principles and norms of international law regarding the execution of sentences and the treatment of convicts.

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Rezyume: *Maqolada O'zbekistonda inson huquq va erkinliklarini himoya qilishning konstitutsiyaviy asoslari, xususan Jinoyat-ijroiya kodeksiga mahkumlarning huquqlari va qonuniy manfaatlarini ta'minlashga qaratilgan o'zgartirish va qo'shimchalar kiritilishi to'g'risida so'z etiladi.*

Резюме: *В статье обсуждаются конституционные основы защиты прав и свобод человека в Узбекистане, в частности, изменения и дополнения в Уголовно-исполнительный кодекс, направленные на обеспечение прав и законных интересов осужденных.*

Kalit so'zlar: *Konstitutsiya, jinoyat ijroiya kodeksi, mahkum, inson huquqlari, qonuniy manfaatlar.*

Ключевые слова: *Конституция, уголовно-исполнительный кодекс, осужденный, права человека, законные интересы.*

**READING STRATEGIES IN EFFECTIVE TEACHING
OF READING**

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Summary: *In an adventurous journey dedicated to teaching foreign languages with innovation and technology, every language teacher can be able to show themselves as the creator and applier of updated and improved teaching tools, systems and processes hoping to bring significant advancements or breakthroughs in the field. Reading is one of the four natural skills which makes a primary contribution to enhance our background knowledge and gives a chance to deal with both past and current affairs too. As reading is a deep source of information which is taken from books, journals, newspapers, magazines and other means of mass media, it is also aimed to represent how reading can influence on learning the foreign language, informing about the effective techniques to the students who are going to learn a wonderful world of English. And this article analyzes how reading can be learned on the bases of new pedagogical technologies and useful techniques.*

Keywords: *Pre-reading phases, Initial reading phases, Rereading phase, target language, teaching strategies, Skimming, Scanning, comprehension, a quick review*

Reading is not only an aim in itself, it is also a means of learning a foreign language. In teaching reading, the teacher's top qualifications, degree and an amount of time s/he has worked on this profession does not have great importance. Indeed, the teacher is extremely adored for his or her skill and positive experience on pedagogy. There are many methods of language teaching and a considerable amount of controversy to the best ways of foreign language teaching in all around the world methodology at present. Several studies indicate reading as the easiest aspect of the language in order to acquire. Readers are not always demanded to access active grammar and difficult idioms. Due to this, their progress can be accelerated quickly and they can sooner feel this rapid improvement. It is said that learners can develop their knowledge on reading independently without the teacher's help. However, teachers play a great role in increasing the learner's level. They should know exactly what their students are expected to achieve from their lessons. And with the purpose of giving such satisfaction teachers operate colorful impressive techniques for successful teaching, particularly reading. [1]

By the 1970s several valuable researchers on reading in the first language had been reaching to the flourishing phases for a couple of decades with the exception of second or foreign language investigations. Considering this **Kenneth Goodman** wrote an article, "*Reading: A Psycholinguistic Guessing Game*" which encouraged specialists of the language to tackle the unique issues and questions of teaching second and foreign language reading. [2]

Reading is an incredibly active occupation, that it is not a passive skill. To manage successfully, we have to grasp the meaning of words, understand the arguments and work on them. And this demands to be aware of using learners' strategies in any appropriate case. In the teaching process effective reading strategies are widely utilized so that students can take benefits from such kind of instructions. Providing that we use these training strategies where and when available in teaching from the younger to the older generation, they can receive expected results because of being trained with such marvelous boosters.

Teacher is an instructor and he can apply teaching strategies to expand the learner's knowledge about the process and maintains opportunities to practice them while reading.

Language instructors urge their students to transfer the strategies exercising in their native language to the target language to avoid confusion and misunderstanding. This serves to stop looking up every unknown word from dictionaries and try to combine sentence and ideas to fully

understand the basic concepts of the passage. One of the most important functions of the effective language instructor is to assist learners to advance a set of reading strategies and match for the suitable reading situations.[3]

As we have mentioned above, reading strategies are in charge of making reading easier, quicker and more impressive. We will prompt to characterize the main strategies as three-part framework below:

1. Pre-reading phases

According to the approaches on reading up to this time, pedagogical stages of reading are being used and they may be held from pre-reading through initial reading and into rereading. In this sequence learners can make both a comprehension and production as well. Here again we will speak about these stages widely with some peculiar features.

Pre-reading activities are very commonly used as a plan for the reading task in front of the reader. This is a kind of quick process to give a short glance to get acquainted with the information of the reading contains such as titles, section headings, photo captions, organization and other details of a selected material for reading. Before reading activities cover a range of possibilities that aid learners to make a discovery and a sense to feel about the content of the text. One common feature of all pre-reading activities is that they are all dedicated to increase student's active participation. As proposed here, this is learner-centered and teacher's function is to set a purpose for suggesting what to read. Selected material should be available to the level, age, background or linguistic knowledge. Chosen texts should attract the readers' attention and interest to be involved.

Pre-reading tasks include listening, speaking and reading and the reading activity should be concerned with these skills. If the text is based on personal experience, it is better to begin with speaking to make them share through communication. On this way, instructor can manage to give students enthusiasm to read the text. The topic itself should be attractive like "The most wonderful, unforgettable or frightening day of my life", etc.

To start with listening, you have a choice whether to play an audio or video recording. Both of them should present an inspiration on the reading. If the content relies on suggestions, for example, manifestations for living meaningful life, show a video with vivid examples, interviews of famous people or real-life experiences. This gives the readers motivation to reveal the secrets on the printed version on their hands.

Last but not least, beginning pre-reading with reading. If the new theme is about "Food and Drinks", it is preferable to start with giving an interesting fact about the origination of one food or drink. **For instance**, you can give a short text about why people know "hot-dog" as it is called or how the coke became popular or the history of how the butter was first made and further on. No matter the text is about try to find something interesting, unfamiliar and not too broad, not too long in order to warm up for the reading task. If the passage before reading is so complicated and boring learners find no desire to read more. That's why struggle to avoid such unwilling situations.



Skimming: One solid example of prereviewing activities is skimming through the pages. While skimming, the attention of reader is captured by the length of the selection, types of information, any figures, illustration, margin notes, review questions, subtitles and basically for the main idea or gist. Students need to be able to skim to obtain general information of what it is about.

To make a quick review it is worthy to fulfill the followings:

Start with looking at the Table of Contents because it symbolizes the main issues for discussion on the text. In some sentences or broader topics you can face with minor heading or subtopics within the main topic. These subheadings give an outline of the information and show the related concepts and ideas to the major objective.

An introductory or conclusive part tells us about what the main concepts, snapshot or overview, objectives, key points and summary section of the article or the passage.

Then, phrases and sentences in different formats, whether highlighted or italicized may direct the reader for the main points or important terms and information defined in the text.

Graphic illustrations and captions give an idea about the meaning of the selection.

It is usual to have some review questions at the end of each reading material and by looking at them learners think about necessary ideas to be able to answer.

Skimming technique is devoted to identify basic questions “*who*”, “*what*”, “*where*” and “*when*” of the text content. And now we will consider an assignment in which using skimming with a high mastery is assessed.

In order to complete the skimming a short period of time, say two minutes or so, is allotted.

All in all, pre-reading grows the following positive features on the purposeful reader:

- In increasing active attendance of learners leaning on their background knowledge;
- In taking charge of their own learning and shaping an autonomous reader;
- In forming strong patience to the confusing ambiguity of words.

2. Initial reading phases

This phase comes after pre-reading and directed at monitoring comprehension. After we have looked through the text, we should have an overall imagination of the topic, what is covered, how structurally organized and related. As far as we know, not all reading passages are offered for extensive reading, but sometimes readers may notice some facts and detailed information with statistics in the text that demand student to take notes while reading. In this phase the term “**scanning**” is used prospectively.

 Scanning is reading quickly to find specific information. For example, one can use scanning when he is looking through the telephone number of a person, reading a time-table of trains in order to find particular date and time of leaving or returning.

We should keep in mind the intention of searching from the text, obviously names, dates, numbers and so on. Therefore, there is no use of reading every word or a line and wasting time reading enjoying and completely understanding the passage. Instead looking for key words, where the required information can be found author’s signaling words to describe hidden sentiments, structural and textual type, are chief points for successful scanning.

Simply scan the passage to get a rough idea of what it is about. Students need to be able to scan the text for particular bits of information they are seeking for. Skimming or scanning depends on the kind of texts the reader is looking through or the objectives from reading, what kind of information they need. Because they may scan any manual of the items which they have recently bought in order to use them, on the other hand they may skim a newspaper article to get a general idea of affairs happening around.

One of the leading functions of an informant while training teaching reading is not only explaining the advantages of skimming and scanning for the reader but supporting them notice the vital importance of the way they are reading.

As we have stated earlier, pre-reading activities stressed the major questions and the initial reading adds details to identify the clarification.

Overall, initial reading helps learners to:

- Know the value of the textual details they have worked on and clarified;
- Evaluate their work through sharing ideas, discussing and on their choices amongst their friends;
- Make an extended analysis of concepts

3. Rereading phase

After reading stage evaluates comprehension using various strategies. In this phase as it is known from its name, we can reinforce our overall understanding of reading passage and comprehend our progress applying particular types of reading tasks. Besides comprehension questions there are a great deal of appropriate forms of activities for past reading. To be more specific, realizing the author’s objectives for writing, discussing synthesizing concepts on engaging in problem-solving cases, learning the study of vocabulary, word usage, grammatical structures and other extra follow-up exercises.

Rereading is the most effective type of reading. Especially in foreign language learning rereading gives the learners an opportunity to revisit and rethink some missed messages they have not noticed in the earlier processes of reading. With the aim of finding their own comprehension of the text, learners need to be given tasks that correspond to their level of knowledge. Also, they should be encouraged to use words and phrases come across in the text when conducting the other skills as writing and speaking too.

At this pedagogical stage learners are able to act as authorized learners because while completing assignments they select their own answers referring to the text. They can defend their choices while taking part in class discussion, work independently on writing and listening comprehension tasks as well. [4]

Teachers can help students develop their skills by offering designed reinforcing activities for different levels, literal, inferential, critical and creative tasks build the student's self-confidence. [5]

We have just looked through three initial ways of working on the text which are stabilized in today's modern the English language teaching methodology. From the time when **M. West** investigated and founded for the "*Methods of Teaching Reading*", so many different terms have been used up to present. Among these the types of reading which we talked about earlier are fixed in modern teaching and become widely used. They are valuable because of making marvelous effects on training reading process.

Having investigated everything that has been stated above, we have come to the following conclusion that reading is not a passive skill, reading is an incredibly active occupation. To do it successfully we have to understand what the word means, see the pictures, understand the agreements and work out if we agree with them. If we don't do these things, we just scratch the service of the text and we quickly forget it. That's why we should encourage students to respond to the content of a reading text not just to the language. It is important to study reading for the way the use of language, the number of paragraphs they contain and how many times they use relative clauses.

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Rezyume: *Chet tillarini innovatsiyalar va texnologiyalar yordamida o'qitishga bag'ishlangan sarguzashtli sayohatda har bir til o'qituvchisi o'zini sohada muhim yutuqlar yoki yutuqlarga erishish uchun yangilangan va takomillashtirilgan o'qitish vositalari, tizimlari va jarayonlarining yaratuvchisi va qo'llovchisi sifatida ko'rsatishi mumkin. O'qish to'rtta tabiiy ko'nikmalardan biri bo'lib, u bizning asosiy bilimimizni oshirishga asosiy hissa qo'shadi va o'tmishdagi va hozirgi voqealar bilan shug'ullanish imkoniyatini beradi. O'qish kitoblar, jurnallar, gazetalar va boshqa ommaviy axborot vositalaridan olingan chuqur ma'lumot manbai bo'lganligi sababli, u o'qishning chet tilini o'rganishga qanday ta'sir qilishini ko'rsatish, ingliz tilining ajoyib dunyosini o'rganmoqchi bo'lgan talabalarga samarali usullar haqida ma'lumot berishga qaratilgan. Ushbu maqolada esa yangi pedagogik texnologiyalar va foydali texnikalar asosida o'qishni qanday o'rganish mumkinligi tahlil qilinadi.*

Резюме: *В авантюрном путешествии, посвященном преподаванию иностранных языков с помощью инноваций и технологий, каждый преподаватель языка может проявить себя как создатель и применение обновленных и улучшенных учебных инструментов, систем и процессов, надеясь добиться значительных успехов или прорывов в этой области. Чтение — один из четырех естественных навыков, который вносит основной вклад в расширение наших базовых знаний и дает возможность решать как прошлые, так и текущие дела.*

Поскольку чтение является глубоким источником информации, взятой из книг, журналов, газет и других средств массовой информации, оно также направлено на то, чтобы показать, как чтение может повлиять на изучение иностранного языка, информируя студентов, которые собираются изучить чудесный мир английского языка, об эффективных методах. И в этой статье анализируется, как можно научиться чтению на основе новых педагогических технологий и полезных методик.

Kalit so'zlar: O'qishdan oldingi bosqichlar, Dastlabki o'qish bosqichlari, Qayta o'qish bosqichi, maqsadli til, o'qitish strategiyalari, Skimming, Skanerlash, tushunish, tezkor ko'rib chiqish

Ключевые слова: Этапы предварительного чтения, начальные этапы чтения, этап повторного чтения, целевой язык, стратегии обучения, беглый просмотр, сканирование, понимание, быстрый обзор

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POLITICS OF TERM CHANGE

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Summary: *This article investigates politics of term change.*

Key words: *language, influence, prestige, function, standardization.*

Language politics is the way language and linguistic differences between peoples are dealt with in the political arena. This could manifest as government recognition, as well as how language is treated in official capacities.

Language planning refers to concerted efforts to influence how and why languages are used in a community. It is usually associated with governmental politics of term change which largely involve status planning, corpus planning and acquisition planning. There are often much interaction between the three areas. Status planning involves giving a language or languages a certain standing against other languages and is often associated with language prestige and language function. Corpus planning often involves linguistic prescription as decisions are made in graphization, standardization and modernization of a language. Acquisition planning fundamentally involves language policies to promote language learning.

"Термин-это основной понятийный элемент языка для специальных целей".[1;14].

Legal status of a language as an official language in a country, state, or other jurisdiction. This generally means that all official documents affecting a country or region are published in the official language(s), but not in those that are not. Evidence in a court of law may also be expected to be presented in an official language.

In countries where there are more than one main language, there are often political implications in decisions that are seen to promote one group of speakers over another, and this is often referred to as language politics. An example of a country with this type of language politics is Belgium.

In countries where there is one main language, immigrants seeking full citizenship may be expected to have a degree of fluency in that language ('language politics' then being a reference to the debate over the appropriateness of this). This has been a feature of Australian politics.

At various times minority languages have either been promoted or banned in schools, as politicians have either sought to promote a minority language with an aim of strengthening the cultural identity of its speakers, or ban its use (either in teaching, or on occasion an entire ban on its use), with an aim of promoting a national identity based on the majority language. An example of recent promotion of a minority language is the promotion of Welsh or Leonese by the Leonese City Council and an example of official discouragement of a minority language is of Breton.

Language politics also sometimes relate to dialect, where speakers of a particular dialect are perceived to speak a more culturally 'advanced' or 'correct' form of the language. Politicians may therefore try to use that dialect rather than their own when in the public eye. Alternatively, at times those speaking the dialect perceived as more 'correct' may try to use another dialect when in the public eye to be seen as a 'man/woman of the people'.

Linguistic imperialism refers to the dominance of one language over another on a national (and sometimes international) scale as a result of language policy and planning. According to Robert Phillipson, it is a variant of linguisticism and is enacted through systemic changes and language attitudes, resulting in unfair treatment of non-dominant language groups. This form of discrimination works in ways similar to racism, sexism, and classism, on a national administrative scale.

As an example, a case study on the usage of Irish Sign Language (ISL) in

Ireland revealed unfair treatment of a deaf community in Ireland. The study observed the enforcement of English over ISL in the educational system, as well as the prohibition of ISL among deaf children who were deemed capable enough to learn oral language. The study also highlighted anti-ISL language attitudes among school officials, unequal pay of ISL teachers, unequal status given to ISL in the education system, and the systemic marginalization of ISL users.

Efforts to elevate the usage of English over ISL also entailed the teaching of Manually Coded English (MCE) to deaf students, a signed language based on the grammatical structure of English. Unfortunately, MCE and other manually coded languages are often difficult and slow to use for communication among signers. Despite this, such language policies have influenced members of the deaf community (especially older members) to internalize the belief that ISL is inferior to spoken language.

Deciding which criteria to adopt for defining a language, however, is far from straightforward. Take the example of the language called 'English'. Who are the speakers of English? Are they the people living in a particular country, England, where the language is spoken? One popular way of deciding the boundary of a language and boundaries between languages is to consider their geography. We generally assume that people living in a particular geographically defined country speak the language associated with it: French in France, German in Germany and so on. 'English' by this definition is the language spoken by people living in England, Great Britain (England, Scotland and Wales) and the United Kingdom (England, Scotland, Wales and Northern Ireland).

However, it is not always the case that people living in a geographically defined area all speak the same language, or that one language is the exclusive 'property' of a particular country. This is certainly not the case with 'English', which is spoken not only in countries that make up the UK, but is also widely used across many countries around the globe, including the United States.

Another factor which has to be taken into account is that English today is widely used in many countries across the globe as the language of business, diplomacy, medicine and the internet. We should also take account of the fact that there are many countries in the world which are not monolingual: that is, they have not one nationally recognized language, but several. For example, in Switzerland, there are three major languages: German, French and Italian. Switzerland recognizes itself as multi-lingual society whereas most of us would agree that Britain (with the exception of Wales) unlike Switzerland, is a monolingual society in that 'everyone speaks English'.

The same could also be said of other countries across the globe, such as the USA, where English is the language of official communication, used in educational contexts, the law, government, the media and so on. However, if we look at the actual languages spoken in areas such as the UK, USA or Australia today, then they include many others besides English. Far from being monolingual, these countries, including those that make up the UK, are actually multilingual, with many inhabitants speaking languages other than English. So although the UK has an official language, 'English', its inhabitants actually come from a vast range of language backgrounds, making the UK linguistically diverse.

This is further complicated by the fact that one of the countries which makes up Great Britain and the UK, the principality of Wales, has two officially recognized languages, Welsh as well as English, and all its inhabitants are taught to be bilingual. This situation is similar to the one in Canada, where people are taught to be bilingual in French and English. In the United States of America, there is no officially recognized national language, and legislating to impose one is forbidden by its constitution, although to all intents and purposes English functions as a national language through its use in public institutions such as education, business and the law. What these examples all illustrate is that what counts as a language then, is not only dependent upon geography, but also upon history, politics and economics.

The association between language and nation or nationality is a very strong and powerful one. The association between language and identity of all kinds, re-

gional and social as well as national, is also very powerful. The languages or varieties of a language that we speak form an integral part of who we are, and attempts at imposing one language or variety of a language on the population of a nation are often bound up with issues of power and ideology. The reasons why one language or one variety of a language becomes associated with a particular nation are many and varied, resulting from a combination of historical and social changes. Throughout history, one of the first things an invading force of another country imposes upon the conquered people is its language, particularly in terms of political, economic and educational institutions and such like.

In present-day linguistics the term variety is used to refer to any variant of a language which can be sufficiently delimited from another variant. The grounds for such differentiation may be social, historical, spatial or a combination of these. English is spoken today on all five continents as a result of colonial expansion in the last four centuries or so. The colonial era is now definitely over but its consequences are only too clearly to be seen in the presence of English as an official and often native language in many of the former colonies along with more or less strongly diverging varieties which arose in particular socio-political conditions, so-called pidgins which in some cases later developed into creoles.

Another legacy of colonialism is where English fulfils the function of a lingua franca. Many countries, like Nigeria, use English as a lingua franca (a general means of communication) since there are many different and mutually unintelligible languages and a need for a supra-regional means of communication. English has also come to play a central role as an international language. There are a number of reasons for this, of which the economic status of the United States is certainly one of the most important nowadays. Internal reasons for the success of English in the international arena can also be given: a little bit of English goes a long way as the grammar is largely analytic in type so that it is suitable for those groups who do not wish to expend great effort on learning a foreign language.

Present-day geographical distribution English is spoken on all five continents.

The politics applied to naming places can also apply to naming ethnic groups. For example, it is generally offensive to use words which are considered by some to have negative implications (pejorative exonyms) to describe a group of people: e.g. 'Gypsies' (or even more negatively, 'Gypos') instead of 'Romani', or indeed using the term 'Gypsies' to cover traveller peoples as well as Romani people.

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Rezyume: Ushbu maqolada shartlarni o'zgartirish siyosati ko'rib chiqiladi.

Резюме: В данной статье исследуются политические изменения терминов.

Kalit so'zlar: til, ta'sir, obro', funktsiya, standartlashtirish.

Ключевые слова: язык, влияние, престиж, функция, стандартизация.

UDC 378

TEACHING TRANSLATION AS A SUBJECT

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Summary: *This article discusses the translation, and teaching translation. It provides information about translation activities, the meaning of translation, methods of teaching translation, as well as translation process.*

Key words: *translation, teaching translation, translation process, translation activity, level, skills and abilities.*

Introduction

Translation, like any other science, is based on theories that should be remembered while translating. These ideas help students understand, but practicing is what actually makes someone a good translator. Before doing anything in the translation classroom, the teacher should know about what the students already know, what they want, and what they like. This knowledge helps pick the right texts for the students [1].

High performance in translation work is more likely to come from those who are naturally gifted in this area. It is also well known that exceptional talent translators, with little to no additional training or effort, have been able to show off their translation abilities right away. But experience shows that translation is not the work of a few people with special talent, and most of those who have studied in this field can easily reach the necessary professional level. Of course, successful education is largely related to the organization of the educational process, curricula and teaching methods. Therefore, translation should be taught as a separate field of study, the acquisition of translation skills is not an activity intended only for exceptionally gifted people. This situation is now fully recognized and in all educational institutions that train translators, students are offered training in the theory and practice of translation. However, not everyone has the same skill, it can be developed and brought to a professional level.

Main part

Teaching translation is not only practical, i.e., it is important to form the necessary translation competence in students. It also fulfills important general linguistic and general educational obligations. Using each language, the characteristics of the "view of the world" reveal common and specific aspects in the culture and thinking of representatives of different language communities. Creating a translation authority helps to develop the personality of future translators in all aspects. The professional training of a translator requires qualities such as high culture, broad encyclopedic knowledge, cordiality, regular updating of knowledge, wide-ranging interests. All these qualities appear in two languages and in two different cultures. The content of any educational direction is determined by the peculiarities of the studied subject and the ultimate goal of education. The theory of translation, whose rules are included in the foundations of the training program for future translators, studies, thinks and describes the essence of translation activity. Therefore, a large part of the courses is devoted to the development of professional translation skills and abilities, to acquire the elements of translation strategy and technique, and to gain experience in translating texts of different levels of complexity.

The organization of translation training and its teaching methods are determined by the adoption of a number of original assumptions: - Translation is a complex and multifaceted type of mental activity, which aims at different goals, in different conditions, in different ways, can be done with and under the influence of many elements. - Certain knowledge, skills that must be formed in the process of teaching in order for translation, like any other activity, to be realized (perform a certain action consciously) and skills (perform a certain action semi-voluntarily and involuntarily

(automatically)). - Translation activity can be performed by the translator consciously (with the help of analysis and based conclusions) or intuitively. The ratio between the conscious and intuitive aspects of the activity is different for different translators, when translating different texts in different conditions. Conscious and intuitive translation skills (interpretive competence) can be developed through training and practice. - The implementation of the translator's authority takes place with the participation of the person related to the language of the translator. Such qualities should be developed and encouraged during translation training. - The task of teaching translation is not to learn some norms, rules and recipes that the translator can apply unwittingly in any situation. in comparison, it can be used in different ways for different purposes [3].

The personal issues solved by the translator in the process of translation require finding a new solution, taking into account the meaning hidden in the text and the specifics of the relevant situation, based on the same mold or general rules of the translation strategy, which allows everyone to apply certain methods and rules individually.

The search for a solution consists of conclusions about the possibility of using a certain rule and method, about the need to choose a unique, occasional solution that changes or abandons the usual, patterned solution. - The object of translation activity is the information in the original text. The content of the text (message) is semantically and formally manifested as a complete whole, whose separate parts are related to each other, but have different importance in the context. The relationship between the whole and its parts is manifested in different ways during the turning process: - Based on the type of translation and its goals. When turning individual elements of the text, depending on their importance, a relatively clear and complete expression can occur. In this sense, the whole may (or may not) be more important than its individual parts. In this sense, there is a problem of expressing the importance of language units as part of the huge content of the text in the translation process. – The specified ratio allows bringing the educational translation used in translation training closer to the working conditions of a professional translator. At the same time, it is possible to use some parts of the text, some expressions, which allow highlighting the translation difficulties and issues of a certain form in the smallest possible part for educational purposes. - In this sense, teaching to translate requires the ability to distinguish typical translation issues in the educational material and the formation of general rules and personal methods of solving them. Different translations may use general rules and methods, as well as specific techniques appropriate for each type. The characteristic of communication between languages determines the principle variety of options for turning a piece of the original. Therefore, in the process of teaching, students are not given the task of creating a single correct (or optimal) view of turning the given text. At the same time, the teaching process includes critical evaluation of educational translations and rejection of inappropriate options. Addressing the issue of translation in English language teaching involves defining a number of concepts related to the term "translation". First of all, this term is used to express a special type of speech activity, which consists in the creation of speech works in a certain language ("translation language" - TT), on a text (original version) whose content is given in another language ("source language" MT) is used. In this case, "translation" is usually called the process of creating such works, as well as its result, that is, the translated text of the finished source. A relationship of "translational equivalence" exists between the original text and the translated text, which is defined for the texts as the maximum possible identity (ie, not absolute identity) of their content plans. Currently, such translation activities, which are increasing in importance and scope, are mainly carried out by professional translators who have the necessary qualifications. In order to competently perform translation activities, the relevant specialist (translator) must have the necessary knowledge, skills and qualifications. Translation competence can be acquired intuitively in the translation activity itself, through errors and trials, or as the goal and result of training in a special educational institution that provides professional training of translators. In the second case, a mandatory part of the training of future translators will be the acquisition of necessary skills and competencies through exercises on translating originals of various complexities. In contrast to professional translation, which is carried out for a specific practical purpose, this type of translation

can be called educational or educational translation. The training translation used in the training of a qualified translator is a more or less complete imitation of his future work.

Thus, the term "translation" can mean the imitation of this process in the educational conditions necessary for the professional training of future translators. Such training can be organized outside the system of teaching foreign languages. The work of a translator implies a necessary level of competence in MT and TT, and therefore, as a rule, the professional training of a translator can be carried out after passing the appropriate training courses for both languages. (It is assumed that the student knows the other of these languages, i.e. the mother tongue, well enough before starting to learn a foreign language.) Such a system of training translators is already a combination of professional translation with the most appropriate foreign language learning causes a problem. From the point of view of teaching translation, this problem is solved relatively simply [2].

First of all, the teaching of translation can be based on the knowledge already acquired, so that the necessary progress in the language learning process can be ensured. The need for such learning is mainly related to the grammatical structure of the language being studied. As for the vocabulary, there are much fewer restrictions here, because any translator can always come across unfamiliar words in the translated text, and one of the tasks of the translation course is to determine the meaning of such words and create the ability to translate them.

There are several reasons for this view.

1. The main difficulty in learning a foreign language is the need to create an independent psycho-physiological mechanism of the new language. Therefore, during the learning process, it is necessary to ensure the "separation" of the mechanisms of the native language and foreign languages, "Translation state", both of these mechanisms are activated and increase unnecessary interference from the native language.

2. The systems of different languages are not compatible with each other, individual units of these systems cannot be compared. These integral and permanent systems can only be mastered from within; and translation makes the student inclined to transfer the laws of the native language system to a foreign language.

3. The most important task of teaching a foreign language is mastering speech in this language. To achieve this goal, so-called speech exercises are necessary, in which the student not only repeats language forms, but also decides for himself which phrases to choose in the target language in the proposed situation.

Conclusion

Translation from the mother tongue into one's own language plays an important role in learning a foreign language, especially at the early stage.

Translation into a foreign language is also an effective means of enriching the student's vocabulary. Based on it, in-depth work is being developed on synonymy, comparison of content-like structures, and typical ways of creating messages in the language under study. Here, a qualified review of the teacher, including the necessary linguistic and regional information, is of great importance. Unlike the usual forms of language learning, when the student is asked to indicate synonyms, form relevant structures, etc., translation work has a clearly defined motivation.

The translation process is related to the continuous assessment of grammatical, lexical and semantic features of possible translation options. This type of work greatly helps the student in mastering the generally recognized ways of expressing thoughts in the language being studied.

Thus, translation classes are a necessary part of the foreign language teaching program, in addition to the undoubted value of teaching translation as a special professional skill.

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Rezyume: Ushbu maqolada tarjima va tarjimani o'rgatish muhokama qilinadi. Unda tarjima faoliyati, tarjimaning ma'nosi, tarjimani o'rgatish usullari, shuningdek, tarjima jarayoni haqida ma'lumotlar berilgan.

Резюме: В данной статье речь пойдет о переводе и обучении переводу. Предоставляется информация о переводческой деятельности, значении перевода, методах обучения переводу, а также процессе перевода.

Kalit so'zlar: tarjima, tarjimani o'rgatish, tarjima jarayoni, tarjima faoliyati, daraja, ko'nikma va malakalar.

Ключевые слова: перевод, обучение переводу, переводческий процесс, переводческая деятельность, уровень, навыки и умения.

THE ROLE OF FINE ARTS IN INCREASING STUDENTS' ARTISTIC THINKING AND CREATIVE ACTIVITY

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Summary: The article contains information about the effect of fine art on increasing the artistic thinking and creative activity of students, the artistic creativity and creative process in fine art, and the aesthetic pleasure of people by reading, seeing, and hearing works of art.

Key words: student, creativity, thinking, Goya, visual arts, artistic creativity, aesthetic taste, art

This increases people's positive behavior, initiative, artistic-aesthetic taste, and culture, and ensures their aspiration towards a specific goal. In visual arts, man creates his own ideas. As we know, artistic ideas are the main meaning and content of fine art. Artistic ideas are taken from life and affect the human mind and psyche based on artistic expressions. The mind and consciousness, thinking, and faith of a person who enjoys the ideas created by himself and gets strength - power rises. High ideals lead a person to noble goals. Creative ideas that make the country prosperous and people's life prosperous include noble goals. Also, the struggle to eliminate alien ideas in the human mind and heart is the main direction of this process.

The inspiring power of fine art, its place and importance in society is that any artistic-aesthetic activity encourages a person to social action and activity. This, in turn, increases the strong confidence in the great future of our country. As a result, in the heart of every citizen, love for the homeland, Uzbekistan, work in the spirit of loyalty to the idea of independence, the desire to increase the cultural, artistic-aesthetic potential of their homeland, and learn the art and culture of their people and embody the beautiful feelings that permeate the human heart and mind.

The influence of fine art is so strong that people absorb any progressive idea, understand that a person can be free only if the Motherland is free, and can respond against any evil idea, and most importantly, people's independent worldview and free thinking are formed, they realize their national identity, it will be possible to educate national pride and pride. In particular, the creative qualities characteristic of our national nature, the sense of respect and patriotism for the holy land of our fathers and grandfathers, and the concept of beauty will expand. In this regard, it is appropriate to think about creativity in creativity and artistic activity.

Creativity is a higher level of consciousness and a complex form of activity, which is characteristic of a person. Creativity is a miracle born as a result of human knowledge, skills, competence, experience and skills. Creativity and creative processes in art, especially in visual arts, the result of creativity is the creation of a work of art. Artistic creativity in visual arts is realized through the creative process. In this, the creator creates a work of art by summarizing the ideological artistic content. In this, the artist's work, will, feelings, memory, thinking, intuition and imagination are manifested as spiritual and practical abilities.

Thus, the will activates creativity as a great force. As a result, a person achieves high results and is formed as a person. With the participation of artistic thinking, existence can be deeply and comprehensively understood. In fact, a work of art is a product of thought. Thinking includes the ideological-aesthetic content of the work of art, as well as worldview and philosophical understanding. Imagination is involved in artistic creation. Creative imagination plays an important role in creative activity.

Inspiration in visual activity ensures quality work with great interest and joy. Intuition-sensitivity is important in human mental activity, i.e. in creative work, especially in artistic creation, which opens a wide path to continuous work and finding new solutions under its influence. A positive effect and consequence of the concept of genius, which is considered a superior quality of

ability and talent in artistic creation, is that it leads to the creation of works of art of worldly importance.

The word art means to make, to work, to polish. Artistically and aesthetically reflecting the reality of life in visual activity, warning people from evil and darkness, and educating them on the basis of high ideals serve goodness. Most importantly, literature and art in any form promote humanity.

The way of life of young people, their way of life, their politeness, their devotion to work and profession are in accordance with the standards of moral education of the national culture. This is connected with the formation of a new worldview in young people, education in the national spirit, development of noble feelings, and achievement of spiritual perfection. In the process of spiritual growth of young people, their legal, political, moral, cultural and ideological ideas are formed and developed. By forming creativity in students, we mean not the creation of some kind of object or artistic work, but the ability to approach each task from its own point of view, to be able to think independently on a problem, to be able to connect all the knowledge acquired during the study to events in life and analyze them, in the field of study we must understand that he expresses his new views. It is necessary to pay special attention to the development of students' ability to express their thoughts in writing.

Fine art is the oldest, and it is divided into such types as sculpture, painting, graphics. It has portrait, landscape, still life, historical, military, animal, household genres. Fine art is an art in which reality, existence is depicted by the artist on a certain plane, surface, space, etc., through the application of shapes, lines, colors, paints. Fine art is a special form of social consciousness, which helps people to learn about the world, to consciously understand the complex and important aspects of life. It shows and visualizes a vivid image of reality. Fine art gives a person aesthetic pleasure. It provides a sense of beauty in a person, higher human feelings, ideological confidence, spiritual independence, and courage. The direct task of fine art in educating the people from an artistic-aesthetic point of view is to create works of art that are suitable for our time and stand at the level of its great ideas and achievements.

The most important task for artists is to bridge the gap between art, life, work and beauty. For example, beauty is not pure, it always appears in connection with something. Straight figure, clear eyes, straight teeth are beauty, all these indicate health, activity, strength and enthusiasm of a person. In this respect, the demand for an artist's work is also reflected in the faithfulness to the reality of life. It should be emphasized that everyone should have aesthetic culture and ability to feel the beauty in visual arts. This in turn ensures that one's desire to create beauty is active and creative, and creates the basis for enjoying beauty and bringing it to life.

The most beautiful product of nature is also the stage of its development - a person who has the same mind - intelligence, will, and the ability to create. It is worth noting that visual art has a very strong positive effect on people's minds, and its main task is to educate a spiritually rich person who has matured in all aspects. Also, visual art is important in enjoying the historical, moral, cultural, and spiritual values of our nation, the wealth of world civilization. It reflects the lives of creative people and their creative power, trust, humanitarianism, loyalty, heroic courage, human image, our glorious history, bright pages of our current life, and their activities in the implementation of the national ideal. It also deeply and comprehensively illuminates the nature of ideas alien to the people.

As a result, by means of effective discussion, impartial criticism and analysis, the most important thing for the healing of the ideological environment in the world of creativity is to mature the members of our society, the young generation, to awaken in their hearts the national idea, national ideology, love and loyalty to their homeland, self-awareness, national and universal education in the spirit of values is achieved. By means of visual art, people can freely express their thoughts and ideas, their reaction to the happening events, increasing the political and spiritual activity of the population, and developing the artistic-aesthetic taste. Fine art is reflected in the artistic, practical and creative work aimed at changing people's social consciousness based on the

laws of beauty, which allows to understand the spiritual world of a person, to get acquainted with its inner secrets. The main task of fine art is to reflect the human being, his multifaceted social activities, to satisfy his spiritual needs, and to develop his creative abilities.

The educational task of fine art is to deliver the rich cultural, artistic and aesthetic heritage created by mankind to future generations, it is a tool that satisfies people's needs, observes their feelings and emotions, changes the world based on the laws of beauty, and serves to form elegant feelings and emotions in people. Also, the most important activity of visual arts is to provide people with aesthetic pleasure and enjoyment by reading, seeing, and hearing works of art.

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Rezyume: *Maqolada tasviriy san'atda o'quvchilarning badiiy tafakkuri va ijodiy faolligini oshirishga ta'siri, tasviriy san'atdagi badiiy ijod va ijodiy jarayon, san'at asarlarini o'qish, ko'rish, eshitish orqali insonning estetik zavqlanishi haqida ma'lumotlar berilgan.*

Резюме: *В статье содержатся сведения о влиянии изобразительного искусства на повышение художественного мышления и творческой активности учащихся, художественное творчество и творческий процесс в изобразительном искусстве, эстетическое удовольствие людей от чтения, просмотра и слушания произведений искусства.*

Kalit so'zlar: *talaba, ijodkorlik, tafakkur, g'oya, tasviriy san'at, badiiy ijod, estetik did, san'at.*

Ключевые слова: *ученик, творчество, мышление, идея, изобразительное искусство, художественное творчество, эстетическое чувство, искусство.*

**SCAFFOLDING – A TECHNIQUE FOR FOREIGN LANGUAGE ACQUISITION
WITHOUT CHALLENGES**

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Summary: *"Education is not the learning of facts, but the training of the mind to think." Albert Einstein's words remind us that the true purpose of education goes beyond the mere acquisition of knowledge. It's about cultivating the capacity for independent thinking, problem-solving, and lifelong learning. In this article, we delve into the world of student-driven learning and the role of strategic instructional techniques, such as scaffolding, in facilitating meaningful learning experiences. We will explore various aspects of student-centered scaffolding, including its significance in fostering engagement, promoting self-regulation, and bridging the gap between students' current understanding and their potential for growth. Through an examination of these topics, we highlight the critical role of well-designed scaffolding in empowering students to reach their full potential within their zone of proximal development.*

Keywords: *the term 'scaffolding', ZPD (Zone of Proximal Development), learning gaps, instructional techniques, scaffolding materials and resources, scaffolded lesson.*

Uzbekistan is making its entry into the international arena. Sh. M. Mirziyoyev - the President of the Republic of Uzbekistan highlighted the problem of cardinal changes in the sphere of foreign language education, the role of science in the specialists training system. He also stated that “Each graduate should know at least two foreign languages perfectly” and started giving it a lot of attention. [1] Language educators are, as such, having a tough time assisting learners in achieving their goals and increasing knowledge. Now with this concurrent era, English is becoming an important language and thus English teachers seek to apply new techniques in practice. One of them is ‘scaffolding’, a tool or technique to provide support for thinking and learning. It is the best way for learners through building from previous skill to higher-level skill. This is called guiding someone through the process if they are not used to it or unable. In scaffolding, the learner works out or accomplishes the aspects of tasks which are over literate to perform independently.[2]

The use of the phrase within education appeared in the 1970s and is most often used in association with the development by Lev Vygotsky. Scaffolding centers around a fundamental idea that Lev Vygotsky, the Russian psychologist representative of ZPD (Zone of Proximal Development), articulates as what children can do by themselves and with help. Vygotsky calls it the ‘zone of proximal development’, which is a distance between the actual developmental level as determined by independent problem solving and their potential developmental level that can be realized through adult guidance or in bodies of more advanced peers. (Vygotsky, 1978, p.86) [3]

The term "ZPD" is frequently used in educational discourse, although it is not as frequently operationalized with any degree of precision in actual educational practice. In order to implement scaffolding in a way that is likely to significantly enhance learning, educators must comprehend and apply the underlying theory's reasoning. [4]

Raymond (2000) proposes the term scaffolding instruction as a process of helping teachers and others support learners in their ongoing development, providing structures to reach them to higher step or stage and helping a learner achieve new learning while not giving up on difficult concepts in order to pass onto next stage or mastery. Learner just needed to undergo a rich experience to learn and environment around had an impact on what he learns; thus, the scaffolds in that were essential for learning.

Scaffolding is a critical component of effective teaching, and all top teachers use instructional scaffolding in their lessons. It is the use of a variety of instructional techniques to

move students progressively toward stronger understanding and greater independence in the learning process. Scaffolding was defined as a bridge to span learning gaps, in other words, the difference between what students have learned and what they are expected to know patterned after society needs at different stages in their education. [5]

In a scaffolded learning environment, the students are allowed to ask questions, give feedbacks, as well as support each other in the process of acquiring new knowledge. When scaffolding is used by teachers in classrooms, instead of being the dominant content expert, he/she will be more of a mentor and facilitator of knowledge. It thus provides a basis whereby students can take an active participation in their own education system. According to Vygotsky, the only good learning occurs when it goes beyond what the learner has already mastered. By providing the right amount of support, scaffolding helps students to engage in activities that are both challenging and achievable, fostering a sense of ownership and motivation. [6]

While some may argue that scaffolding is time-consuming and difficult to implement in the classroom, especially in resource-constrained environments, research has shown that it can be effective in improving student learning outcomes. By carefully designing scaffolding interventions that are tailored to the needs and abilities of students, teachers can create a more inclusive and supportive learning environment that promotes student engagement and achievement. Transitioning to Vygotsky's Zone of Proximal Development, which is a critical concept in understanding the role of scaffolding in the classroom, it is essential to note that scaffolding is most effective when it is aimed at helping students to reach the outer limits of their ZPD. By working in this zone, students can learn new skills and knowledge that they are not yet able to master independently. This approach also highlights the importance of social interaction in the learning process, as it often involves the teacher or tutor working closely with the student to model the task, provide feedback, and offer support.

One potential counterargument to the use of scaffolding is that it may inhibit students' ability to think critically and solve problems on their own. However, this is not the case, as scaffolding is designed to be removed once the student is able to complete tasks independently. In fact, scaffolding can actually enhance students' critical thinking and problem-solving skills, as it allows them to engage with complex tasks and ideas that they would not be able to tackle on their own. This is important in language learning, as it allows students to develop the skills they need to communicate effectively in real-world situations.

Over the past few decades, the concept of scaffolding in the context of education has received a great deal of attention, but despite its importance in bilingual education, there are still many questions about how scaffolding is conceptualized in bilingual education research. These questions include: (1) what scaffolding means in the research on contexts where teachers integrate content and language learning; (2) how these kinds of scaffolds can be provided in bilingual education lessons; and (3) very little information about the motivations of teachers themselves for providing scaffolding in these contexts. Taken together, these issues make it challenging to have a meaningful discussion with researchers and practitioners about the several ways in bilingual education. [7]

With a view to overcome those confronted obstacles, we should be aware of using different types of scaffolds in the learning atmosphere. Three primary categories can be used to classify scaffolds: material resources, instruction and student grouping.

Resources and materials are the teaching aids that can be given to students while they are doing their assignments. Such kind of materials can be mostly visual like graphic organizers, glossaries, dictionaries, extra handouts for home and word banks. Because when the teacher offers a student an additional material to reinforce their comprehension with one of the above-mentioned materials, learners may strengthen their knowledge by practicing and with support.

In addition to these scaffolded materials, teacher can scaffold the instructions so that the students do not find to do the task challenging. Educators can reach this by pre-teaching vocabulary, providing familiar elements of instruction from their background knowledge, repeating,

paraphrasing and modeling. In supporting English learners' understanding of new content, it is important to provide them in the teaching-learning process. For instance, when we teach new vocabulary that is used in the activity to the students before doing the task, they can be involved in the process of doing the activity more than not knowing the meaning of unfamiliar words and their usage in context. Modeling is also one of the most effective scaffolds for any diverse learners. Because activities are modeled so that learners clearly understand what is expected of them.

After selecting materials and giving instructions, we should also decide on groupings. Grouping students is an effective scaffold too as they can facilitate each other, learn from one another and teach each other in working together. In grouping students, we should pay attention to their level of knowledge, interests, skills, in general, strengths and needs so that everyone can take a necessary outcome from collaboration and cooperation.

Having contemplated all these types of scaffolds, we sit to plan our lesson, that is basically called 'a scaffolded lesson'. Even though planning and preparing to teach differentiated scaffolded lessons that meet the needs of language learners of varying proficiency levels can seem like a daunting task, once the teacher gains practice and experience with these steps, the process will become an intuitive part of a lesson planning. Before you begin to run a scaffolded lesson, you should know about your learner. The information you should be aware is about the student's home language, level of literacy, educational background and proficiency from the target language. Second step is to analyze the language demands of the lesson. In adopting each activity, you should analyze the academic-language demands of every task. In other words, what will the learners have to do during the lesson, and what challenges might they face? The next step is to plan your lesson appropriately. Your lesson plan is like a recipe of a delicious dish, if you forget or do not pay attention to a single element, then it can be ruined and you may not get what you actually want to get at the end. That's why it is very crucial to have a good lesson plan before entering the classroom. The fourth step is to select and develop appropriate materials for the students. To master the language, learners should be given suitable materials so that they can do everything cognitively.

Last but not least, teach the lesson, adapting scaffolding and materials as needed. [8] Conducting such an organized and scaffolded lesson, our learners will reach expected outcomes and be willing to participate in every lesson eagerly.

In conclusion, scaffolding is a crucial component of language learning, providing a specific form of just-in-time support that enables learners to reach higher levels of proficiency and achievement. The distinction between scaffolding and general teacher support has been clarified, and the benefits of targeted scaffolding in language learning have been highlighted. Through the use of scaffolding, both teachers and peers can offer assistance tailored to individual learners' needs, fostering a more effective learning environment. As our understanding of scaffolding deepens, it is essential that educators continue to explore and apply scaffolding principles in bilingual education. By doing so, we can significantly enhance language learning outcomes and empower students to reach their full potential.

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Rezyume: "Ta'lim - bu faktlarni o'rganish emas, balki aqlni fikrlashga o'rgatishdir". Albert Eynshteynning so'zlari ta'limning asl maqsadi shunchaki bilim olishdan tashqarida ekanligini eslatib turadi. Bu mustaqil fikrlash, muammolarni hal qilish va umrbod ta'lim olish qobiliyatini tarbiyalashdan iborat. Ushbu maqolada biz talabalar tomonidan boshqariladigan ta'lim olami va mazmunli o'rganish tajribasini osonlashtirishda o'qituvchilar talabalarga yangi kontseptsiya yoki ko'nikmalarni o'rganish va rivojlantirishda muayyan turdagi yordamni taklif qiladigan strategik o'qitish usullarining rolini ko'rib chiqamiz. Biz talabalarga yo'naltirilgan bunday usullarning turli jihatlarini, jumladan, uning faollikni rivojlantirish, o'z-o'zini tartibga solishni rag'batlantirish va talabalarning hozirgi tushunchalari va o'sish potentsiallari o'rtasidagi tafovutni bartaraf etishdagi ahamiyatini o'rganamiz. Ushbu mavzularni ko'rib chiqish orqali biz o'quvchilarga o'zlarining proksimal rivojlanish zonalarida o'zlarining to'liq potentsiallarini ro'yobga chiqarishga yordam berishda yaxshi mo'ljallangan usullarning muhim rolini ta'kidlaymiz.

Резюме: «Образование – это не изучение фактов, а тренировка ума, чтобы думать». Слова Альберта Эйнштейна напоминают нам, что истинная цель образования выходит за рамки простого приобретения знаний. Оно предполагает развитие независимого мышления, решения проблем и обучения на протяжении всей жизни. В этой статье мы рассматриваем роль стратегических методов обучения, в которых учителя предлагают конкретные виды поддержки учащимся в обучении и разработке новых концепций или навыков, способствуя получению опыта обучения, ориентированного на учащихся, и значимому опыту обучения. Мы исследуем различные аспекты таких ориентированных на учащихся методов, в том числе их важность для стимулирования вовлеченности,ощущения саморегуляции и преодоления разрыва между текущим пониманием учащихся и потенциалом роста. Затрагивая эти темы, мы подчеркиваем важную роль хорошо разработанных методов, помогающих учащимся полностью раскрыть свой потенциал в зонах ближайшего развития.

Kalit so'zlar: "Scaffolding" atamasi, ZPD (proksimal rivojlanish zonasi), o'rganish bo'shliqlari, o'qitish usullari, o'qituvchilar talabalarga yangi kontseptsiya yoki ko'nikmalarni o'rganish va rivojlantirishda muayyan turdagi yordamni taklif qiladigan strategik o'qitish usulining materiallari va resurslari, yordam taklif qilingan dars.

Ключевые слова: Термин «scaffolding», ZPD (зона ближайшего развития), учебные пространства, методы обучения, стратегический метод обучения, при котором учителя предлагают учащимся определенный тип поддержки в изучении и развитии новой концепции или материалов и ресурсов для навыков. помогите предложенный урок.

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SOCIAL FACTORS IN LANGUAGE CHANGE

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Summary: *This article investigates social factors in language change.*

Key words: *criteria, language, monolingual, national language, bilingual.*

Deciding which criteria to adopt for defining a language, however, is far from straightforward. Take the example of the language called 'English'. Who are the speakers of English? Are they the people living in a particular country, England, where the language is spoken? One popular way of deciding the boundary of a language and boundaries between languages is to consider their geography. We generally assume that people living in a particular geographically defined country speak the language associated with it: French in France, German in Germany and so on. 'English' by this definition is the language spoken by people living in England, Great Britain (England, Scotland and Wales) and the United Kingdom (England, Scotland, Wales and Northern Ireland).

However, it is not always the case that people living in a geographically defined area all speak the same language, or that one language is the exclusive 'property' of a particular country. This is certainly not the case with 'English', which is spoken not only in countries that make up the UK, but is also widely used across many countries around the globe, including the United States.

Another factor which has to be taken into account is that English today is widely used in many countries across the globe as the language of business, diplomacy, medicine and the internet. We should also take account of the fact that there are many countries in the world which are not monolingual: that is, they have not one nationally recognized language, but several. For example, in Switzerland, there are three major languages: German, French and Italian. Switzerland recognizes itself as multi-lingual society whereas most of us would agree that Britain (with the exception of Wales) unlike Switzerland, is a monolingual society in that 'everyone speaks English'.

The same could also be said of other countries across the globe, such as the USA, where English is the language of official communication, used in educational contexts, the law, government, the media and so on. However, if we look at the actual languages spoken in areas such as the UK, USA or Australia today, then they include many others besides English. Far from being monolingual, these countries, including those that make up the UK, are actually multilingual, with many inhabitants speaking languages other than English. So although the UK has an official language, 'English', its inhabitants actually come from a vast range of language backgrounds, making the UK linguistically diverse.

This is further complicated by the fact that one of the countries which makes up Great Britain and the UK, the principality of Wales, has two officially recognized languages, Welsh as well as English, and all its inhabitants are taught to be bilingual. This situation is similar to the one in Canada, where people are taught to be bilingual in French and English. In the United States of America, there is no officially recognized national language, and legislating to impose one is forbidden by its constitution, although to all intents and purposes English functions as a national language through its use in public institutions such as education, business and the law. What these examples all illustrate is that what counts as a language then, is not only dependent upon geography, but also upon history, politics and economics.

The association between language and nation or nationality is a very strong and powerful one. The association between language and identity of all kinds, regional and social as well as national, is also very powerful.

The language, languages or varieties of a language that we speak form an integral part of who we are, and attempts at imposing one language or variety of a language on the population of a nation are often bound up with issues of power and ideology. The reasons why one language or one variety of a language becomes associated with a particular nation are many and varied, resulting from a combination of historical and social changes. Throughout history, one of the first things an invading force of another country imposes upon the conquered people is its language, particularly in terms of political, economic and educational institutions and suchlike. In present-day linguistics the term variety is used to refer to any variant of a language which can be sufficiently delimited from another variant. The grounds for such differentiation may be social, historical, spatial or a combination of these.

"Термин-это словесное обозначения понятия, входящего в систему понятий определённой области профессиональных знаний" [1;14].

English is spoken today on all five continents as a result of colonial expansion in the last four centuries or so. The colonial era is now definitely over but its consequences are only too clearly to be seen in the presence of English as an official and often native language in many of the former colonies along with more or less strongly diverging varieties which arose in particular socio-political conditions, so-called pidgins which in some cases later developed into creoles.

Another legacy of colonialism is where English fulfils the function of a lingua franca. Many countries, like Nigeria, use English as a lingua franca (a general means of communication) since there are many different and mutually unintelligible languages and a need for a supra-regional means of communication. English has also come to play a central role as an international language. There are a number of reasons for this, of which the economic status of the United States is certainly one of the most important nowadays. Internal reasons for the success of English in the international arena can also be given: a little bit of English goes a long way as the grammar is largely analytic in type so that it is suitable for those groups who do not wish to expend great effort on learning a foreign language.

Present-day geographical distribution English is spoken on all five continents. With regard to numbers of speakers it is only exceeded by Chinese (in its various forms) and Spanish. But in terms of geographical spread it stands at the top of the league. The distribution is a direct consequence of English colonial policy, starting in Ireland in the late 12th century and continuing well into the 19th century, reaching its peak at the end of the reign of Queen Victoria and embodied in the saying 'the sun never sets on the British Empire'. The varieties of English in the modern world are divided into four geographical groups as follows:

- 1) Britain
- 2) America
England. United States. Scotland . Canada
Wales .African American Vernacular English Ireland .The Caribbean
- 3) Africa
- 4) Asia, Pacific West, Africa, India and South East Asia ,South Africa, Australia and New Zealand, East Africa. The Pacific islands region

The two main groups are Britain and America. For each there are standard forms of English which are used as yardsticks for comparing other varieties of the respective areas. In Britain the standard is called Received Pronunciation. The term stems from Daniel Jones at the beginning of the present century and refers to the pronunciation of English which is accepted -that is, received - in English society. BBC English, Oxford English, Queen's English (formerly King's English) are alternative terms which are not favored by linguists as they are imprecise or simply incorrect.

In America there is a standard which is referred to by any of a number of titles, General Raymond Hickey Varieties studies American and Network American English being the two most common. There is a geographical area where this English is spoken and it is defined negatively as the rest of the United States outside of New England (the north east) and the South.

The southern United States occupy a unique position as the English characteristic of this area is found typically among the African American sections of the community.

These are the descendants of the slaves originally imported into the Caribbean area, chiefly by the English from the 16th century onwards. Their English is quite different from that of the rest of the United States and has far more in common with that of the various Anglophone Caribbean islands. Those varieties of English which are spoken outside of Britain and America are variously referred to as overseas or extraterritorial varieties. A recent practice is to use the term English's (a plural created by linguists) which covers a multitude of forms. The label English World-Wide (the name of an academic journal dedicated to this area) is used to refer to English in its global context and to research on it, most of which has been concerned with implicitly comparing it to mainland varieties of Britain and America and then with trying to determine its own linguistic profile.

Extraterritorial varieties are not just different from mainland varieties because of their geographical distance from the original homeland but also because in many cases a type of suspension has occurred *vis a vis* [face to face] changes in point of origin, i.e. in many respects the overseas varieties appear remarkably unchanged to those from the European mainland. This phenomenon is known as colonial lag. It is a term which should not be overworked but a temperate use of the term is appropriate and it can be cited as one of the features accounting for the relative standardness of overseas varieties, such as Australian or New Zealand English with regards to British forms of English. The varieties of English both in Europe and overseas tend to show variation in certain key features, for instance special verbal structures to express aspectual distinctions are common to nearly all varieties in the developing world.

Pronunciation and morphology features can equally be classified according to frequency of variation in non-standard forms of the language. To facilitate orientation in this sphere a table of those features is offered below which typically vary among both mainland and extraterritorial forms of English. Note that the variation in the area of lexis (vocabulary) tends to be restricted to two types.

The first is the presence of archaic words no longer found in mainland Britain, e.g. the use of **bold** in the sense of misbehaved or wench as a non-derogative term for woman.

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All languages change over time. English has undergone continuous and dramatic change throughout its three major periods: Old English (roughly from 450 to 1100 AD), Middle English (from 1100 to 1500), and Modern English (from 1500 to the present). Although Chaucer's Middle English is at least partially comprehensible today, Old English looks like a completely foreign language.

The inevitability of language change is guaranteed by the way in which language is passed on from one generation to the next. Children do not begin with an intact grammar of the language being acquired but rather must construct a grammar on the basis of the available data. In such a situation, it is hardly surprising that differences arise, even if only subtle ones, from one generation to the next. Moreover, since all children draw on the same physiological and cognitive endowment in learning language, it is to be expected that the same patterns of change will be consistently and repeatedly manifested in all languages. Following is a brief overview of the principal causes of language change.

Historical linguistics studies the nature and causes of language change. The causes of language change find their roots in the physiological and cognitive makeup of human beings. Sound changes usually involve articulatory simplification, as in the case of the most common type, assimilation. Analogy and reanalysis are particularly important factors in morphological change. Language contact resulting in borrowing is another important source of language change.

All components of the grammar, from phonology to semantics, are subject to change over time. A change can simultaneously affect all instances of a particular sound or form, or it can spread through the language word by word by means of lexical diffusion. Sociological factors can play an important role in determining whether or not a linguistic innovation is ultimately adopted by the linguistic community at large. Since language change is systematic, it is possible, by identifying the changes that a particular language or dialect has undergone, to reconstruct linguistic history and thereby posit the earlier forms from which later form have evolved. Using sets of cognates, comparative reconstruction allows us to reconstruct the properties of the parent or proto-language on the basis of systematic phonetic correspondences.

Studies in historical linguistics can provide valuable insights into relationships among languages and shed light on prehistoric developments. Furthermore, historical studies of language are of great importance to our understanding of human linguistic competence.

In fact, it has often been stated that language change provides one of the most direct windows into the workings of the human mind. Furthermore, the study of language change contributes to our understanding of how social, cultural, and psychological factors interact to shape language. Finally, the integration of studies on language change, language acquisition, and language universals remains one of the most important challenges facing linguists today.

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Rezyume: *Ushbu maqola til o'zgarishidagi ijtimoiy omillarni o'rganadi.*

Резюме: *В данной статье исследуются социальные факторы изменения языка.*

Kalit so'zlar: *mezon, til, bir tilli, milliy til, ikki tilli.*

Ключевые слова: *критерии, язык, одноязычие, национальный язык, двуязычие.*

HOW TO TEACH SENTENCE STRUCTURES OF THE GERMAN LANGUAGE TO PUPILS

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Summary : *In the article the author shares her experience of teaching sentence structures of the German language to school pupils, using a variety of techniques.*

Key words: *sentence structure, subordinate clauses, main clauses, visual aids.*

Teaching the structure of German sentences to pupils requires an approach that breaks down the complexity of German grammar into manageable and comprehensible segments. German, with its flexible word order and specific rules for sentence construction, necessitates a strategic teaching method to help students grasp its nuances. Here is an article outlining effective methods and strategies for teaching the structure of German sentences, supplemented with relevant quotes from authoritative sources.

Understanding German Sentence Structure

German sentence structure can be broadly categorized into main clauses (*Hauptsätze*) and subordinate clauses (*Nebensätze*). Each has distinct rules governing word order. The main clause typically follows a Subject-Verb-Object (SVO) order, whereas the subordinate clause often uses a Subject-Object-Verb (SOV) structure.

1. Main Clauses

In German main clauses, the verb generally occupies the second position. This rule applies regardless of whether the sentence starts with the subject or another element (e.g., an adverb or a prepositional phrase). For example:

- Subject-first: "*Ich lese ein Buch.*" (*I am reading a book.*)
- Element-first: "*Morgen gehe ich zur Schule.*" (*Tomorrow, I am going to school.*)

"The verb-second rule is a defining characteristic of German main clauses, providing a fixed point in an otherwise flexible word order" [1.123.]

2. Subordinate Clauses

Subordinate clauses begin with a subordinating conjunction (e.g., "*dass*," "*weil*," "*obwohl*") and place the conjugated verb at the end of the clause. For example:

- "*Ich denke, dass er kommt.*" (*I think that he is coming.*)
- "*Sie bleibt zu Hause, weil sie krank ist.*" (*She stays at home because she is sick.*)

"In subordinate clauses, the conjugated verb is placed at the end, a rule that helps to distinguish these clauses from main clauses and maintain clarity in complex sentences" [2.211.] It proves the fact that English sentence structures differs from German ones.

Here are: teaching strategies:

1. Start with Simple Sentences

Begin with simple SVO sentences to build a foundation. Use clear, context-based examples to illustrate the subject, verb, and object positions. Practice these structures through repetition and exercises:

- Example: "*Der Hund (S) jagt (V) die Katze (O).*" (*The dog chases the cat.*)

2. Introduce Sentence Elements

Gradually introduce additional sentence elements such as time, manner, and place (TMP). Emphasize how these elements can be positioned at the beginning of the sentence for emphasis, with the verb still in the second position:

- Example: "*Heute (T) geht (V) er (S) ins Kino (P).*" (*Today, he is going to the cinema.*)

Ed Swick highlights the importance of these elements: "Understanding the role of time, manner, and place in sentence structure helps students form more natural and varied sentences" [3.34.] Therefore, teaching adverbs of place and their positions a must-have thing for us.

3. Use Visual Aids

Visual aids, like sentence diagrams and color-coded charts, can help students visualize sentence structure. Highlight the position of the verb in main and subordinate clauses:

- Example Chart:

- Main Clause: [Subject] - [Verb] - [Object]

- Subordinate Clause: [Subordinating Conjunction] - [Subject] - [Object] - [Verb]

4. Practice with Subordinate Clauses

Introduce subordinate clauses by combining them with main clauses. Start with common conjunctions and practice forming complex sentences. Provide exercises that require students to identify and place verbs correctly:

- Example: "Ich weiß, dass er kommen wird." (I know that he will come.)

5. Interactive Activities

Engage students with interactive activities such as sentence-building games, role-playing, and writing exercises. These activities reinforce their understanding and make learning enjoyable. For instance, use sentence strips that students can rearrange to form correct sentences.

6. Reinforce with Consistent Practice

Consistent practice through homework assignments, quizzes, and in-class exercises is crucial. Encourage students to write their sentences and correct mistakes collaboratively to foster a supportive learning environment.

Common Challenges and Solutions

1. Verb Positioning Confusion: Students often struggle with placing the verb in the correct position. Reinforce the rule through repetition and visual aids.

2. Subordinate Clause Complexity: The verb-final rule in subordinate clauses can be challenging. Simplify by initially using conjunctions like "dass" and gradually introduce more complex ones.

3. Word Order Variability: The flexible word order in German can confuse students. Focus on core rules and gradually introduce variations.

Conclusion

Teaching the structure of German sentences requires a clear, step-by-step approach that builds from simple to complex. By using visual aids, interactive activities, and consistent practice, students can master the rules of German sentence construction. Understanding these structures not only enhances their language skills but also boosts their confidence in using German effectively.

According to the quotation which summarises well: "Effective teaching of German grammar involves breaking down complex rules into understandable parts, using a variety of teaching aids and methods to cater to different learning styles" [4.45]

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Rezyume: Maqolada muallif nemis tilidagi jumla tuzilmalarini turli xil usullardan foydalangan holda maktab o'quvchilariga o'rgatish tajribasi bilan o'rtoqlashadi.

Резюме: В статье автор делится опытом обучения школьников предложениям немецкого языка с использованием различных методов.

Kalit soʻzlar: gap tuzilishi, ergash gaplar, bosh gaplar, koʻrgazmali qurollar.

Ключевые слова: структура предложения, придаточные предложения, главные предложения, наглядные пособия.

UDK 81

USING MULTIMEDIA TO IMPROVE VOCABULARY SKILLS

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Summary: *The article "Utilizing Multimedia Tools to Enhance Lexical Skills" explores the effectiveness of employing multimedia tools in foreign language learning, particularly in the context of expanding vocabulary. The author examines various methodologies, including the use of videos, audio recordings, interactive applications, and other multimedia resources to improve students' acquisition of new vocabulary. The article also assesses the impact of this approach on students' motivation and overall success in learning a foreign language. The findings from this study can be valuable for educators and curriculum developers involved in designing foreign language learning programs.*

Keywords: *methodology, communication, innovation, multimedia, interactive approach.*

The methodology of teaching the Russian language is one of the pedagogical sciences. She studies the processes of teaching schoolchildren their native language (their acquisition of knowledge about the language, the formation of their language and speech skills). Without well-developed speech skills, without the ability to express one's thoughts, quickly and correctly perceive others' opinions, it is impossible to study in a modern school, as well as to become a full-fledged member of society. To solve its problems, the methodology selects the best options within the framework of a class-lesson system, a strictly limited number of lessons and the volume of educational material according to approved programs and textbooks using equipment - from notebooks and chalkboards to language laboratories, television and computers.

In the school course of the Russian language, all its levels are studied: phonetic, lexical-semantic and grammatical. It includes concepts that describe these levels. Historically, in the methodology of teaching the Russian language, special areas have developed, which set out the methodology for studying concepts included in the school curriculum: phonetic - in the method of phonetics, morphemic - in the method of morphemics, word-formation - in the method of word formation, morphological - in the method of morphology, syntactic - in syntax technique. In the early 70s. A new area of methodology for teaching the Russian language has emerged, in which lexical and phraseological concepts are studied - the methodology of vocabulary and phraseology. The independence of the listed areas of methodology is determined by the fact that each of them, corresponding to the corresponding section of the science of language, has its own goals, content, methods of teaching and control. Each of them has its own research methods.

The vocabulary of a language, representing a certain system, includes different categories of words that are interconnected by various relationships that develop on the basis of common semantic features. This gives grounds for highlighting vocabulary in a special section of the Russian language school course.

A multimedia approach to teaching makes it possible to realize modern educational goals - the formation of communicative competence of students and the cultivation of tolerance in society. The new approach to teaching the Russian language is based on methods and techniques that promote effective learning. It is known that some people can master a language immediately, while others find it difficult to master a language. Despite the complexity of the learning process, the teacher is looking for ways, ways in which language learning will be effective and useful for everyone.

Modern information technologies allow you to quickly gain access to a large amount of information, which allows you to change established teaching methods. This technology is definitely the Internet, which allows you to access a huge amount of information.

The use of the Internet simplifies and expands the possibilities for teaching in the field of languages, as it allows you to quickly and interestingly obtain the necessary information.

In today's schools, the computer is a teaching tool with great potential. Computer training programs have many advantages over traditional teaching methods (training various types of speech activities, developing communication skills, automating language and speech actions, implementing an individual approach, independent work of students). Various means of multimedia technologies have significantly expanded the potential of teachers, significantly facilitated their work, optimized the learning of foreign languages, and made this process interesting and educational.

The development of modern society occurs in the era of informatization, characterized by the use of information technology in many areas of human activity, including in the field of education. [8]

A rational combination of traditional educational means with modern information and computer technologies is one of the possible ways to solve the problem of modernizing education.

Information and computer technology tools contribute to the development of personal qualities, variability and individualization of school education. Modern information and computer technologies ensure students' active, creative mastery of the subject being studied and allow them to present the material at a new, qualitatively higher level. The use of information computer technologies opens up fundamentally new opportunities in organizing the educational process [5].

In the process of teaching foreign languages in a modern secondary school, lighting and sound equipment are traditionally used. But now new information technologies have come to school: a computer, a multimedia textbook, the Internet, an electronic educational resource. [7]

Nazarov S.V. believes that the introduction of modern computers and the use of new information and pedagogical technologies represents a qualitatively new stage in teaching foreign languages [5].

Computerization of foreign language teaching helps facilitate access to information and reduce the time of language learning. At the moment, there is a huge selection of multimedia resources containing the information necessary for learning a foreign language, electronic textbooks, databases with thematic texts and exercises. The use of information technologies allows us to highlight the following basic provisions aimed at reflecting the direction of the use of information computer technologies in the educational process:

- the use of multimedia technologies in teaching foreign languages is designed to significantly increase the effectiveness of teaching, the main goal of which is to improve the skills of everyday and professional communication (both direct with native speakers and indirect through the Internet, the press);
- means of new information technologies act as a tool for the education and upbringing of students, the development of their communicative, cognitive, creative abilities and information culture;
- the use of multimedia teaching aids allows, in the absence of a natural language environment, to create conditions that are as close as possible to real verbal communication in foreign languages.

The use of multimedia in teaching gives rise to a number of features that are appropriate from the point of view of psychological and pedagogical science and the educational process. One of these aspects is the psychology of communication between teachers and students with multimedia resources and computer equipment. [6]

Using modern information technologies and multimedia resources in education, it should be noted that the level of interactive interaction between a student and a computer is determined by the content and level of intellectual development of the student [1][2].

When discussing didactic and methodological aspects of using computers and multimedia resources in education, the main attention is paid to organizing independent educational activities, developing critical thinking, a culture of communication, and the ability to perform various social roles.

It is advisable to consider the use of multimedia technology in teaching in four main areas:

- computer and multimedia technologies as objects of study
- computer and multimedia technologies as a means of presenting, storing and processing educational information
- computer as a means of organizing educational interaction
- computer as a means of managing educational activities [4].

It is multimedia that has the most powerful impact on students. They enrich the learning process and make learning more effective by involving most of the student's sensory components in the process of perceiving educational information. They have become an objective reality of our time, and a foreign language teacher simply cannot help but take advantage of the opportunities they provide for teaching real communication in a foreign language [9].

By multimedia we mean information technologies that use various software and hardware for the most effective impact on the learner, who is at the same time a reader, a listener, and a viewer [Nekrasova N.A.].

According to N.A. Savchenko, multimedia is a complex of hardware and software that allows the user to work interactively with heterogeneous data (graphics, text, sound, video), organized in the form of a unified information environment; computer interactive integrated systems that provide work with animated computer graphics and text, speech and high-quality sound; still images and moving video; technology that describes the development, operation and use of information processing tools of various types; synthesis of three elements: digital information (texts, graphics, animation), analog visual information (video, photographs, paintings, etc.) and analog sound information (speech, music, other sounds); a special generalizing type of information that combines both traditional statistical visual (text, graphics) and dynamic information of various types (speech, music, video fragments, animation) [8].

Thus, multimedia technologies are understood as a number of computer technologies that make it possible to collectively present various types of information (graphics, text, video, photography, animation, sound effects) and operate with them in accordance with existing targets. This interpretation of multimedia is the most optimal from the point of view of teaching foreign languages and prevails in practice, including when designing a multimedia educational lesson [10].

According to their methodological purpose, the following types of multimedia teaching aids are distinguished:

- mentoring, designed to learn new material;
- training (simulators) designed to process skills and abilities while repeating and consolidating the studied material;
- controlling ones, designed to control the level of mastery of educational material; information and reference, intended for students to obtain the necessary information, intended to create a model of an object, process, phenomenon for the purpose of studying and researching them;
- simulation, representing a certain aspect of reality to study its basic structural or functional characteristics using a certain limited number of parameters;
- demonstrations, designed for visual presentation of educational material, visualization of studied patterns, relationships between objects; gaming, designed to "play out" a learning situation in order to make an optimal decision or develop an optimal action strategy for the development of thinking;
- leisure activities, intended for extracurricular work with the aim of developing attention, reaction and creative thinking [3].

There is no doubt that multimedia technologies enrich the learning process and make learning more effective by involving most of the student's sensory components in the process of perceiving educational information. According to G. Kirmayer, when using interactive multimedia technologies in the learning process, the share of learned material can be up to 75%. [5] Multimedia technologies have transformed educational visualization from static to dynamic, that is, it has

become possible to track the processes being studied over time. Previously, only educational television had this opportunity.

Modeling processes that develop over time and interactively changing the parameters of these processes is a very important didactic advantage of multimedia learning systems. Moreover, quite a lot of educational tasks are related to the fact that it is impossible to demonstrate the phenomena being studied in a classroom; in this case, multimedia tools are the only possible ones today.[2][7][9]

Multimedia technologies in the process of teaching foreign languages are designed to perform the following functions:

- integrate different types of information in one container object (text, sound, video, etc.) and present it, influencing different organs of human senses;
- develop critical thinking;
- stimulate the cognitive process;
- carry out interactive interaction with the student;
- adapt to the needs of the student;
- individualize the learning process;
- organize group work in multimedia environments;
- develop teamwork skills;
- create sustainable motivation;
- create conditions as close to reality as possible for developing educational and professional skills (virtual laboratories, excursions, museums) [6].

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Rezyume: *“So‘z boyligini oshirish uchun multimedia vositalaridan foydalanish” maqolasida chet tilini o‘rgatishda, ayniqsa, so‘z boyligini kengaytirish sharoitida multimedia vositalaridan foydalanish samaradorligi ko‘rib chiqiladi. Muallif o‘quvchilarning yangi lug‘atni o‘zlashtirishini yaxshilash uchun turli usullarni, jumladan, videolar, audioyozuvlar, interaktiv ilovalar va boshqa multimedia resurslaridan foydalanishni ko‘rib chiqadi. Maqolada, shuningdek, ushbu yondashuvning talabalarning motivatsiyasiga va ularning chet tilini o‘rganishdagi umumiy muvaffaqiyatiga ta’siri baholanadi. Kalit so‘zlar: metodologiya, kommunikatsiyalar, innovatsiyalar, multimedia, interaktiv metodologiya.*

Резюме: *Статья "Использование мультимедийных средств для совершенствования лексических навыков" исследует эффективность применения мультимедийных*

инструментов в обучении иностранному языку, особенно в контексте расширения словарного запаса. Автор рассматривает различные методики, включая использование видео, аудиозаписей, интерактивных приложений и других мультимедийных ресурсов для улучшения усвоения новой лексики учащимися. Статья также оценивает влияние такого подхода на мотивацию учащихся и их общую успешность в освоении иностранного языка.

Kalit so'zlar: metodologiya, aloqa, innovatsiya, multimedia, interaktiv metodologiya.

Ключевые слова: методика, коммуникации, инновация, мультимедиа, интерактивная методика.

ISSUES OF FURTHER IMPROVEMENT OF THE MECHANISM OF LEGAL PROTECTION OF LEGAL AND LEGITIMATE INTERESTS OF BUSINESS ENTITIES AND FOREIGN INVESTORS

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Summary: *This article analyzes the implementation of various subjects of protection of rights and interests of business entities and also analyzes the form, types and issues of further improvement of legal protection of rights and legitimate interests of business entities and foreign investors at the new stage of judicial and legal reforms in New Uzbekistan.*

Key words: *subject of entrepreneurship, foreign investors, entrepreneurial activity, forms of legal protection, Strategy “Uzbekistan – 2030”, Principle of “people's court” court, constitutional court, Supreme Court, economically, administrative courts, state bodies.*

As we all know, in recent years, under the leadership of President Sh.Mirziyoyev, comprehensive reforms have been implemented in all spheres of our country's life, especially in the field of judiciary. [1, 118]

These ongoing reforms are necessary for the effective protection of the constitutional rights and legal interests of citizens and business entities and foreign investors related to civil legal property relations, as well as for the wide use of alternative methods and forms of conflict resolution, not only ensuring the independence of the central government and the achievement of justice. by creating legal conditions and further improving the constitutional and legal foundations of the judicial power, it allowed us to take important and priority tasks to a new stage, such as gaining the trust of citizens. [2, 136]

In the Address of the head of our state presented to the Oliy Majlis, he focused on improving the judiciary in order to ensure justice and the rule of law in our country, improving the court system, raising the level of citizens' access to justice, improving the quality of hearing cases in court, as well as taking the activity of economic courts to a new level based on advanced foreign experiences. In this regard, the specific proposals and instructions given by the President on the establishment of the International Commercial Court in Uzbekistan clearly confirm the importance of the effective implementation of judicial reforms. [3]

The newly adopted constitution, the strategy of development and the strategy of "Uzbekistan-2030", which is its logical continuation, set the idea of building a fair and modern state at the service of the people. casting a conversion task. [4]

Strengthening measures to protect the rights and legal interests of citizens and entrepreneurs, as well as creating conditions for their free activity, while improving the quality of services provided to them are defined as the main tasks of state bodies and judicial authorities in our country, these responsible functions are adapted to the priority tasks set in the formation of a modern market economy in our country.

Analyzing the scientific literature, it can be said that the forms of protection of the rights and legal interests of citizens and entrepreneurs have been studied by legal scholars and various opinions and theories have been expressed.

Among them, among the legal scholars, O. Okyulov and F. Otakhanovs “...the legal protection of business entities of the state authorities is the adoption of regulatory legal documents establishing the legal basis of the business entities within their powers, active professional activity shown in the protection of their rights and interests that are at risk of being violated or violated” [5, 78] notes.

Legal scholars express their views on these problematic theoretical concepts from a scientific point of view, including O.A. Abakumova, A.V. Lyubanenko and A.A. If Chukreev divides the protection of the rights and interests of business entities into out-of-court (before-trial) protection and in-court protection” [6].

A. Kurbatov, in line with these opinions, states that "...he divides the protection of the rights of business subjects into non-jurisdictional and jurisdictional forms and includes judicial, administrative and notary procedures for the jurisdictional form of legal protection" [7].

Also E.B. Abakumova divides the protection of the rights of business entities into court and out-of-court protection, and out-of-court protection into notary and arbitration court procedures. [8]

M. E. Abdusalomov divides legal protection into legal and non-legal forms, and legal protection into general and special protections, and shows that protection in general is a judicial method of protection, and special protection is an administrative procedure. [9, 147]

Among these legal scholars, O. Kamalov, while analyzing the legal and practical aspects of forms of protection of the rights and interests of business entities in court and out of court, and their types, "understanding the forms of legal protection of the rights and interests of business entities is the key it is necessary to approach based on the relevant national legal system and law enforcement practice. Because the forms of legal protection of the rights and interests of business entities are the practical expression and external appearance of the protection of rights. [10]

It is no exaggeration to say that the economic courts established in 2017 under the leadership of our president have increased the level of legal protection of citizens, business entities and foreign investors. The reason is that according to the words of our president, the real essence of the reforms carried out in our country today is the legal protection of the rights and interests of business entities, especially the improvement of the investment environment in our country, the economy is to achieve people's well-being through development. In order to support business entities, especially to attract investors from abroad, it is necessary to create for them, first of all, a favorable business environment, guarantees that legal rights and interests related to property relations will be protected by various entities. In order to properly protect the rights of investors in our country in the course of rapid reforms, it was important to establish a special judicial structure in the Supreme Court to deal with investment disputes and cases related to competition. According to it, large investors have the right to apply directly to the Supreme Court to resolve the dispute. That is, according to the wish of the parties in the case of competition related to investment disputes, cases of this category will be considered directly by the Supreme Court, and all other investment disputes will be considered by the court of the Republic of Karakalpakstan, regional and Tashkent city courts as the court of first instance, according to the wish of the investor. Undoubtedly, the most important and the biggest achievement in the field is that in 2019-2022 and in the first half of 2023, 1,232 cases on investment disputes were heard, and relevant court decisions were made to satisfy claims in 681 cases. [11]

Based on this, legal scientist O. Kamalov, in addition to his opinion, it is worth noting that the legal forms of ensuring the legal protection of the rights and freedoms of citizens, business entities, and the legal interests of foreign investors related to property relations are difficult to understand today. requires a scientific approach in the case of the national legal system formed as a result of comprehensive reforms carried out at the stage of development of each country and the practice of law enforcement. Because "...forms of legal protection of the rights and interests of business entities are actually a practical expression and appearance of the protection of rights". [10]

It is necessary to understand the form of legal protection of the rights and interests of business entities in the CIS countries belonging to the Romano-Germanic legal family as common forms of legal protection and protection before the court.

In the new version of the Constitution of the Republic of Uzbekistan, everyone is guaranteed the right to protect their rights and freedoms through the court, to appeal to the court against illegal decisions, actions and inaction of state bodies and other organizations and their officials. In order to restore violated rights and freedoms, everyone is guaranteed the right to have their case reviewed by a competent, independent and impartial court within the time limits set by the law. [12]

Economy In our procedural legislation, any interested person has the right to apply to the economic court (court) in accordance with the procedure established by this Code in order to protect his violated or disputed rights or interests protected by law. In the cases stipulated by the legislation,

there are rules that other persons have the right to apply to the court [13]. It can be seen that the courts are the highest instance of protecting the rights and interests of a person.

Our legal scholars O.A. Abakumova, A.V. Lyubanenko and A.A. Chukreev and O. Kamalov in their research consider the form of out-of-court protection of the rights and interests of business entities as a pre-trial form of protection. We also fully agree with this opinion of these authors, because pre-trial protection is not the absolute last instance of protection of relevant rights and interests. As can be seen from the data, although the definitions given by scientists to the concept of the form of legal protection of the rights and interests of business entities are unique and different, but they can be seen in common aspects that complement each other. Current legislation does not exclude the right of a business entity to appeal to the court to protect its rights and interests.

Legal scholar O. Kamalov defined the concept of legal protection of the rights and interests of business entities, "... the form of legal protection of the rights and interests of business entities in the following two directions: the first direction is the conduct of the courts according to the grounds directly defined in the legal documents if it protects the rights and interests of business entities within the framework of solving related issues, the second courts protect the rights and interests of business entities as a last resort (as well as the last instance). In addition, "... the protection of the rights and interests of business entities by economic courts, according to the current Criminal procedure code, economic courts protect the rights of business entities within the framework of the resolution of certain disputes arising in the system of public-legal relations, while in the administrative-legal protection of their rights in the judicial procedure, in administrative cases Courts also have important powers and provide accountability for violations of sanctioned norms. In this regard, the role and position of the Constitutional Court in protecting the rights and interests of business entities is important, and although these courts do not directly implement the administrative-legal protection of the rights of business entities, they interpret that they have the authority to have their own legal influence in this regard." [10].

Summarizing the above opinions, if we agree with the opinion of the author, it is worth saying in addition that the independent and diligent protection of the rights and legal interests of business entities and foreign investors related to property relations can be divided into two directions:

the first is that business entities and foreign investors fully protect their constitutional rights and legal interests related to property relations in an independent manner;

the second is that business entities and foreign investors effectively protect their constitutional rights and legal interests related to property relations together with the state body and the economic justice system [14, 195].

Thus, the settlement of economic disputes is carried out by various entities that have legal powers in accordance with the rules of current legislation and international agreements. In this case, specific legal situations (factual and legal grounds) prompt the initiation of the appropriate form of protection. In general, due to the judicial activity and efficiency of the state bodies and specialized courts with appropriate powers, business entities and foreign investors can be sure that their cases related to property relations will be considered by competent bodies and independent judges.

This is a favorable condition for the development of the economy in the country by supporting business entities, especially for the further improvement of the investment environment, the promotion of attracting direct investments, the strengthening of the confidence of foreign investors in the consistency of the policy of our country in this regard, and the increase of the responsibility of state structures and the judicial system in working with investors. creates conditions

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Rezyume: *мазкур мақолада Янги Ўзбекистон тараққиёт даврида фуқаролар ва тадбиркорлик субъектларининг ҳуқуқ ва манфаатларини ҳимоя қилиш турли субъектлар томонидан амалга оширилиши таҳлил қилиниб, суд ҳуқуқ ислохотларининг янги ривожланиши босқичида фуқаролар, тадбиркорлик субъектлари ва чет эл инвесторларининг ҳуқуқ ва қонуний манфаатларини ҳуқуқий ҳимоя қилиш шакллари, турлари ва уларни янада такомиллаштириши масалалари тадқиқ этилган.*

Резюме: *В данной статье анализируется осуществление различными субъектами защита прав и интересов субъектов предпринимательства а также проводится анализ формы, виды и вопросы дальнейшего совершенствования правовой защиты прав и законных интересов субъектов предпринимательства и иностранных инвесторов на новом этапе судебно-правовых реформ в Новом Узбекистане.*

Kalit soʻzlar: *тадбиркорлик субъекти, чет эл инвестиорлари, тадбиркорлик фаолияти, ҳуқуқий ҳимоя қилиш шакллари, “Ўзбекистон-2030” стратегияси, “Халқшил суд” тамойили, суд, конституциявий суд, Олий суд, иқтисодий ва маъмурий судлар, давлат органлари.*

Ключевые слова: *“субъект предпринимательства, иностранные инвесторы, предпринимательская деятельность, формы правовой защиты, Стратегия “Узбекистан – 2030”, Принцип “народного суда” суд, конституционный суд, Верховный суд, экономически, административные суды, государственные органы.*

ON THE DIDACTIC POSSIBILITIES OF THE CURRICULUM “METHODS OF TEACHING KARAKALPAK LANGUAGE AND LITERATURE”

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Summary: *The article talks about the development of the subject “Methods of teaching Karakalpak language and Literature” its current state, topics and suggestions that need to be included in the development. The results achieved by suggested changes.*

Key words: *plot, theme, content, task, linguistic competence, principles.*

Actually, the problems of teaching the Karakalpak language and Literature in our Republic were investigated by E.Berdimuratov and K. Pirniyazov [1], the methods of teaching Karakalpak Literature in secondary schools [2], have been studied by scholars such as S.Axmetov, Á.Paxratdinov, Á.Pirnazarov, K.Palimbetov, I.Pirniyazov and R. Berdimuratova, moreover, M.K.Koshanov has worked on the issues of comparison of Russian and Karakalpak languages in the teaching process [3], B.Kutlmuratov has published articles on the matters of teaching Karakalpak language and handwriting skills in Karakalpak elementary schools.

We, as a scientific and professional group, have become familiar with the curriculum of the subject of “Methods of teaching Karakalpak language and Literature”, and its educational content. Furthermore, we could be acquainted with the higher education institution syllabus and training hours on developing students' language competence. During our investigation, we analyzed the syllabuses for the Bachelor's Degree students' of the following higher educational institutions such as, Karakalpak State University 60230100 – Philology and Karakalpak language, Nukus State Pedagogical Institute 5111300 – Mother tongue and Literature (Karakalpak language and Literature) and Navoi State Pedagogical Institute 6011500 – Karakalpak language and Literature which serve development of linguistic competence of university students. In this study at Karakalpak State University, 11 topics are devoted to the methods of teaching the Karakalpak language, whereas 11 topics are devoted for the methods of teaching Karakalpak Literature. These topics include course content, lectures, seminars, self-study and self-assignments, educational outcomes (professional competence) required by the students, educational technology and methods, and requirements for obtaining credits and relevant literature for the course.

The purpose of the course is to train and provide future specialists with the knowledge about methods of teaching Karakalpak Language and Literature, teaching principles, teaching methods, organizing and conducting lessons, as well as the development of teaching methods in accordance with the requirements of state educational standards.

The objective of the subject is to teach the students the origin, creation and development of the course of Methods of teaching Karakalpak language and Literature, to improve the principles, methodological heritage, critical thinking about teaching Karakalpak language and Literature, to inspire patriotism, to instruct teaching methods and techniques, visual and interactive methods, to make course programs and lesson plans.

In addition, international bachelor's programs are capable of modernizing Karakalpak education, and the characteristic idea of participation in education is the main task of students understanding the connection between school disciplines through a combination of students' knowledge, experience and practical skills, students receive an education relevant to the world with which they deal.

In fact, during the practical courses, it is significant that the idea of the students' subjective position in the learning process needs to increase its relevance in the modern Karakalpak School. For its implementation, it would be beneficial to use effective, practical and active learning methods like Project work etc. Therefore, one of the most effective ways to implement the idea of subjective

communication in education in the organizing social and individual projects among Bachelor's Degree students.

Consequently, students will be able to learn to set goals, improve skills, select appropriate tools for goals, and search for information. It is vital to increase the role of students' self-motivation.

One of the most important aspects of the modernization of education in our Republic is the improvement of its educational component. Briefly, among the most important goals we are able to present the following:

- developing students' autonomy and ability for self-improvement;
- raising ability to protect own rights;
- instructing collaboration;
- promoting cooperation;
- evolving kindness, tolerance towards others.

The empowerment of linguistic competence of KarSU philology students is a system-forming element in the complex of pedagogical conditions, and the "Methods of teaching Karakalpak language and Literature" has served as the introduction of pedagogical technology of the educational and methodological complex.

The planned pedagogical process presents the basic methodological document on teaching the course "Methods of teaching Karakalpak language and Literature" as the main program for teaching writing skills.

In order to set up aforesaid teaching program, we have focused on the following:

- the necessity of an objective need for an educational and methodological complex;

- training program should be focused on a specific pedagogical technology in order to implement the content and achieve the goal.

The educational and methodological complex "Methods of teaching Karakalpak language and Literature" has been developed with the aim of identifying the readiness of future teachers for methodological, professional and intellectual teaching process.

The teaching program has been made based on the results of research in the field of effective communication in the development of students' (future teachers') linguistic competence and adaptation to the teaching process:

- The cumulative change in the development of scientific knowledge: psychology, physiology and methodology are combined with the acquisition of new data.

In doing so, we relied on the following principles:

Principles of "Methods of teaching Karakalpak language and Literature" used in teaching

No.	Principles	Contents Principles
1	Scientifically conceptualized	Focus on specific scientific principles
2	Capable and purposeful development	Focus on achieving the specified results
3	Forecasting is also an activity	Ensuring the effectiveness of the educational process and predicting the future needs
4	Self-leading approach	Full development as a person in the student's press conference
5	Determined and optimized approaches	Cancelling ready theory and practice for common life situations, preparing for special and concrete situations, the best concepts and investigation.

Analysis of outstanding pedagogical technologies, teaching at the place of study, and students' work on the "Methods of teaching Karakalpak language and Literature" made it possible to conclude about a special pedagogical technology. The teaching program "Methods of teaching Karakalpak language and literature" is focused on the clarity of the content and structure of the

professional program of language competence of a philologist-teacher. We rely on the following principles:

- a) **systematicity** - logical ordering, relying on the previous information, discovering the connection between blocks of information;
- b) **Continuity** – regular and autonomous research;
- b) **universality** - the ability to accept specific knowledge as part of general knowledge, to combine knowledge related to different spheres into one complex;
- g) **efficiency** – readiness to retain knowledge in various situations;
- d) **adaptability** - the ability to freely use methods in a changing state of knowledge.

Each module shows what students need to know, how to practice and what experiences they need to develop linguistic competence.

The topics presented in teaching process of the course move from theoretical foundations to concrete methodological practice. It is not a coincidence, but it is determined by the improvement of students' language competence.

The typology of the the previous mentioned course “Methods of teaching Karakalpak language and Literature” has been studied as a special type of teaching program:

- has been noted as a structural table content program, because learning materials are organized without returning to previous ones;
- during the learning process they will be made once, directly and consequently related to each other.

During our studies, we became acquainted with the training program “Methods of teaching Karakalpak language and Literature” at Karakalpak State University 60230100 – Philology and other languages (Karakalpak language). Due to the fact that the current movement of the program is different from the program, and the work is being carried out in the field of development, the section “Methods of teaching Karakalpak language and Literature” is recommended to be divided into modules.

The structure of the module “Methods of teaching Karakalpak language and Literature” for the development of linguistic competence of philology students of KarSU

Module	№	Current topics	Suggested topics
Module 1 Teaching methods of Karakalpak language	.	“Methods of teaching Karakalpak language and Literature” as a subject.	“Methods of teaching Karakalpak language and Literature” as a subject. Methods and techniques used in teaching Karakalpak language.
	.	Principles of learning Karakalpak language.	Methods of improving the students’ writing skills. The types of dictations and their usage.
	.	Methods and techniques used in teaching Karakalpak language.	Methods and techniques used in teaching Karakalpak language. Methods of teaching phonetics in the Karakalpak language. Development of diction, accentology, and orthographic norms in pronouncing sounds correctly.

	.	Methods of using new pedagogical technologies in Karakalpak language lessons.	Methods of teaching lexicology in Karakalpak language lessons. Effective Usage phrases and proverbs in speech.
	.	Ways of organizing and conducting Karakalpak language lessons .	Teaching of word formation rules in the Karakalpak language, correct spelling of root, suffixes and compound words.
	.	Providing Karakalpak language lessons with visual aids.	Interactive activities for teaching vocabulary in the Karakalpak language.
	.	Methods of teaching phonetics and lexicology.	Ways of teaching Parts of speech and simple sentences.
	.	Methods of teaching morphology and syntax.	Interactive activities used in teaching stylistics.
	.	Types of writing tasks, ways of organizing and assessing them.	Ways of classroom management and leadership improvement.
	0.	Ways of improving students' vocabulary.	Methods of creating multimedia programs related to the topic in the Karakalpak language
	1.	Organizing extra lessons and seminars on Karakalpak language.	Ways of assessing students' knowledge. Summative, formative, diagnostic assessment.
Module 2. Teaching methods of Karakalpak literature	2.	The aim of the "Methods of teaching Karakalpak Literature" and its tasks.	Ways of development of the student's vocabulary stock and the works of T.Qayypbergenov, K.Karimov, M.Nizanov.
	3.	The connection of methods of teaching Karakalpak literature with other subjects.	Innovative technologies in teaching Karakalpak literature. Ways of writing an essay in the genre of drama, tragedy.
	4.	Historical development of literature teaching methodology.	Development of students' discursive competence in literature lessons.
	5.	The order of learning materials in the program.	Teaching method of folklore genre. Learning works of bards using multimedia programs.
	6.	Methods of teaching input jobs.	Using radio and television in learning classical poetry. Prepare video clips and upload them to the Internet.

	7.	Expressive reading and ways of organizing it.	Karakalpak writers. Artisticism, increasing imagery, development of short stories (edited by Kh. Dáwletnazarov) in teaching works of Karakalpak poets and writers.
	8.	Types of lessons and ways of conducting them.	Ways of preparing videos using the Internet and uploading them to the site in teaching foreign literature.
	9.	Innovative technologies in teaching Karakalpak literature.	Methods of increasing the tone, timbre, and range of the voice of the singing-poetry students during the period of independence.
	10.	Ways of improving students' writing and speaking skills.	Methods of developing students' self-study skills, preparing them for negative and positive situations.
	11.	Learning biographies of poets and writers.	Techniques of improving students' reading and critical thinking.
	12.	Extra lessons and seminars.	Encourage creative and positive thinking and improvisation in teaching literature lessons.

The subject of the course “Methods of teaching Karakalpak language and Literature” introduces the tasks of the Karakalpak language and literature, interdisciplinary teaching, teaching methods, educational and methodological complexes. In this case, the importance of all legal and regulatory documents of the country is overestimated. New technologies in the development of students' linguistic competence are analyzed. It is shown how to rationalize the process of developing the linguistic competence of a young philologist: when developing appropriate tasks, motives and needs in order to develop linguistic competence, the introduction of new technologies is taken into account.

The previous mentioned teaching program is actively involved in the development of linguistic competence of students, the need for which arises in connection with the modernization of modern schools.

The key to developing relevant personal knowledge is the proper development of active learning skills. Thus, it is necessary to distinguish between different teaching methods. The “Methods of teaching Karakalpak language and Literature” includes the following methods of intellectual work of students in their daily work:

- highlighting reference points in the material, dividing the text into sections;
- works, dissertations, abstracts;
- creation of a logical diagram of the material, highlighting the corresponding connections;
- interpretation of histograms, diagrams, tables;
- remember the necessary clarifications in the text.

In modular learning, lecture (lesson) is the required form of learning and the student works hard to solve the problem individually. In addition, students learn to prepare abstracts,

presentations, and analyze new material. They help students gain basic knowledge and develop their linguistic competence.

Teaching philologists in higher educational institutions serves to provide conditions for the special development of language competence, the implementation of scientific training programs, and the selection of effective pedagogical technology that guarantees the achievement of the goals of education. In this process, each activity is considered as an element of learning. Materials providing the necessary skills for both theoretical and practical training, student goals, scope of educational material and tools of the educational process.

In conclusion, we note that the development of linguistic competence of a philologist-teacher is of particular importance in modern technologies, and successful results can be achieved by ensuring the effectiveness of development. In the process of working with modules, students can achieve their goals fully and individually. The main goal of our research is to set up teaching program and activities of the course. This will provide students to gain educational material successfully.

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Rezyume: *Maqolada oliy o'quv yurtlarida «Qoraqalpoq tili va adabiyotini o'qitish metodikasi» fanining fan dasturi, uning hozirgi holati, dasturga kiritilishi kerak bo'lgan mavzular, takliflar hususida so'z boradi. O'zgartirishlar kiritish orqali erishiladigan natijalar ko'rsatiladi.*

Резюме: *В статье говорится о развитии предмета «Методика преподавания каракалпакский язык и литература», его современного состояния, темах и предложениях, которые необходимо включить в разработку.*

Kalit so'zlar: *fan dastur, mavzu, fan mazmuni, fan vazifasi, lingvistik kompetensiya, mezonlar.*

Ключевые слова: *учебная программа, тема, содержание предмета, задача предмета, языковая компетентность, принципы.*

HOW TEACHER PROFICIENCY CAN IMPACT ON STUDENTS' MOTIVATION AND FURTHER ACHIEVEMENTS?

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Summary: *This article explores the intricate relationship between teachers' professional skills and student motivation, arguing that highly developed professional skills contribute significantly to fostering a learning environment that encourages students to strive for further achievements. It examines key teacher skills such as pedagogical expertise, classroom management, emotional intelligence, communication skills, and collaborative practices, analyzing their impact on student motivation, engagement, and ultimately, academic success. The article draws upon existing research and literature to support its claims and offers practical recommendations for teachers to enhance their professional skills and cultivate a motivating learning environment.*

Keywords: *Teacher Professional Development, Student Motivation, Pedagogical Expertise, Classroom Management, Emotional Intelligence, Communication, Collaboration.*

Introduction

The role of a teacher extends beyond simply imparting knowledge; it encompasses fostering a love for learning, nurturing curiosity, and empowering students to reach their full potential. This critical role hinges on the teacher's possession of a diverse range of professional skills that cultivate a positive learning environment and inspire students to strive for further achievements. While academic content is vital, it is the teacher's ability to engage, inspire, and empower students that truly makes the difference in their academic journey. This article investigates the crucial link between teachers' professional skills and student motivation, exploring how specific skills can impact student engagement and academic success.

Main part

In the first place, the Significance of Teacher Professional Skills. The impact of teachers on student motivation and success is undeniable. Research consistently demonstrates that effective teaching practices, driven by well-developed professional skills, significantly enhance student engagement, learning, and performance (Hattie, 2009). A teacher who possesses a deep understanding of their subject matter, masterful pedagogical strategies, and effective classroom management techniques can create an environment where students feel valued, challenged, and motivated to learn.

There are five key professional skills that demonstrably contribute to fostering a learning environment conducive to student motivation and achievement.

Firstly, Pedagogical expertise refers to a teacher's ability to select and apply appropriate teaching methods and strategies based on the specific needs and learning styles of their students. Teachers who possess strong pedagogical skills understand how different students learn, utilize a variety of teaching strategies, and cater their instruction to meet individual student needs (Brookhart, 2008). This individualized approach fosters a sense of ownership and empowerment in students, boosting their confidence and motivation to learn.

The second one is Effective classroom management. Effective classroom management is essential for creating a positive and productive learning environment. Teachers who excel in this area establish clear expectations, implement consistent routines, and utilize appropriate behavior management techniques to minimize disruptions and maximize student engagement (Emmer & Stough, 2018). A well-managed classroom fosters a sense of safety, order, and respect, allowing students to focus on their learning without distractions, thereby promoting motivation and academic progress.

Emotional Intelligence is the next one, Emotional intelligence (EQ) plays a significant role in fostering positive student-teacher relationships. Teachers high in EQ possess the ability to

understand and manage their own emotions, recognize and respond effectively to the emotions of others, and build strong, empathetic connections with their students (Goleman, 1995). This empathy and understanding create a supportive and encouraging environment where students feel valued and understood, fostering a sense of belonging and promoting intrinsic motivation to learn.

The forth skill is Communication Skills, Effective communication is the cornerstone of successful teaching. Teachers who possess strong communication skills are adept at conveying information clearly and engagingly, providing clear and constructive feedback, and fostering open and respectful dialogue with their students (Weinstein, 2011). This open and supportive communication style allows students to feel heard and understood, boosting their confidence and motivation to participate in the learning process.

The last but not least Collaborative Practices:

Collaborative practices, such as group work, peer-to-peer learning, and teacher-student collaboration, can be highly motivating for students. By fostering collaboration, teachers encourage students to learn from each other, develop critical thinking skills, and share their own ideas and perspectives (Johnson & Johnson, 2009). This collaborative environment can create a sense of community and shared responsibility for learning, fostering intrinsic motivation and a desire to contribute to the collective success of the group.

The Impact of Teacher Skills on Student Motivation and Achievement is obvious from different perspectives and researches.

Research consistently shows a strong link between teachers' professional skills and student motivation and achievement. Studies have found that teachers with strong pedagogical skills, effective classroom management, high EQ, excellent communication skills, and a commitment to collaborative practices are more likely to have students who are engaged, motivated, and achieve higher levels of academic success (Hattie, 2009; Brookhart, 2008). These skills contribute to a learning environment where students feel safe, respected, valued, and challenged, fostering a desire to learn and strive for further achievements.

As a matter of fact, there were created Practical Recommendations for Teachers who are really responsible for their job and want to build an enjoyable and effective teaching proficiency.

Teachers can enhance their professional skills and cultivate a motivating learning environment by:

- Engaging in ongoing professional development: Staying current with research and best practices in education by attending workshops, conferences, and seeking out mentorship opportunities.
- Developing their pedagogical expertise: Exploring and experimenting with different teaching strategies to find the best methods for their students.
- Improving their classroom management skills: Implementing effective routines, strategies, and consistent behavior management techniques to maintain a productive learning environment.
- Building their emotional intelligence: Practicing self-awareness, empathy, and active listening to establish strong relationships with students and create a supportive classroom atmosphere.
- Enhancing communication skills: Utilizing clear and engaging language, providing constructive feedback, and fostering open dialogue with students.
- Implementing collaborative practices: Incorporating group work, peer-to-peer learning, and teacher-student collaboration to encourage student interaction and shared responsibility for learning.

Conclusion

Teachers play a pivotal role in motivating students and fostering their academic success. By cultivating a diverse range of professional skills, teachers can create a learning environment that empowers students to embrace challenges, strive for further achievements, and unlock their full potential. Engaging in ongoing professional development, implementing effective teaching practices, and building strong student-teacher relationships through empathy, communication, and collaboration are key to maximizing student motivation and success.

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Rezyume: *Ushbu maqola o'qituvchilarning kasbiy mahorati va talabalar motivatsiyasi o'rtasidagi murakkab munosabatlarni o'rganib, yuqori darajada rivojlangan kasbiy ko'nikmalar o'quvchilarni keyingi yutuqlarga intilishga undaydigan o'quv muhitini shakllantirishga sezilarli hissa qo'shishini ta'kidlaydi. U pedagogik tajriba, sinfni boshqarish, hissiy intellekt, muloqot qobiliyatlari va hamkorlik amaliyotlari kabi asosiy o'qituvchilarning ko'nikmalarini o'rganadi, ularning talabalar motivatsiyasiga, faolligiga va oxir-oqibat, akademik muvaffaqiyatga ta'sirini tahlil qiladi. Maqola o'z da'volarini qo'llab-quvvatlash uchun mavjud tadqiqotlar va adabiyotlarga tayanadi va o'qituvchilarning kasbiy mahoratini oshirish va rag'batlantiruvchi ta'lim muhitini yaratish uchun amaliy tavsiyalar beradi.*

Резюме: *В этой статье исследуется сложная связь между профессиональными навыками учителей и мотивацией учащихся, утверждая, что высокоразвитые профессиональные навыки вносят значительный вклад в создание учебной среды, которая побуждает учащихся стремиться к дальнейшим достижениям. В ней рассматриваются ключевые навыки учителя, такие как педагогическая компетентность, управление классом, эмоциональный интеллект, коммуникативные навыки и совместные практики, анализируется их влияние на мотивацию учащихся, вовлеченность и, в конечном счете, академический успех. Статья опирается на существующие исследования и литературу для подтверждения своих утверждений и предлагает практические рекомендации для учителей по повышению их профессиональных навыков и созданию мотивирующей учебной среды.*

Kalit so'zlar: *O'qituvchilarning professional rivojlanishi, O'quvchilarning motivatsiyasi, Pedagogik malaka, Sinfni boshqarish, Emotsional intellekt, Kommunikatsiya, Hamkorlik.*

Ключевые слова: *Профессиональное развитие учителей, Мотивация учащихся, Педагогическая компетентность, Управление классом, Эмоциональный интеллект, Коммуникация Сотрудничество.*

THE NEW UZBEKISTAN CONSTITUTION IS CONSISTENT BASIS OF JUDICIAL REFORMS

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Summary: *This article examines the effective protection of the rights and freedoms and legitimate interests of citizens at a new stage in the development of judicial law reforms during the emergence of New Uzbekistan. In the administration of justice, first of all, the scientific definitions and concepts given to the institution of an independent judiciary in the scientific literature have been clarified, the role and significance of the judiciary have been investigated, and questions of further improvement of the justice system have been examined.*

Key words: *independent judiciary, judicial system, justice system, “Uzbekistan-2030” strategy, “International court” principle, court, constitutional court, Supreme Court, status of judges, system of municipal bodies.*

Today, effective protection of human rights and freedoms in our country largely depends on judicial authorities and their effective activities. Establishing an independent and fair judiciary in Uzbekistan is a priority of state policy, and it has become one of the main issues in the constant focus of our country's President Shavkat Mirziyoyev.

In the address of the head of our state presented to the Oliy Majlis, he focused on the issues of improving the judiciary in ensuring justice and the rule of law in our country, improving the court system, raising the level of citizens' access to justice, how important is the effective implementation of judicial reforms? clearly confirms that he has a mind [1].

After all, the court is the highest point of justice and increasing its role is a legal process for the establishment of a legal democratic state.

In particular, the new version of the Constitution of the Republic of Uzbekistan, which was adopted by a national vote in the referendum of the Republic of Uzbekistan held in our country on April 30, 2023, creates the political and legal basis for the implementation of the New Uzbekistan strategy and is a priority for the further development of the state and society, including the judicial system, at a historically important stage of the development of national statehood. determined the directions.

First of all, Chapter XXIII of the newly revised Constitution was dedicated to the judiciary. In this chapter, first of all, in the Republic of Uzbekistan, justice is carried out only by the court, and the judiciary acts independently of the legislative and executive authorities, political parties, and other institutions of civil society [2].

In addition, the judiciary should act independently of the legislative and executive authorities, political parties, other public associations, the procedure for organizing courts and the judicial system of the Republic of Uzbekistan, in which the powers of the Constitutional Court, as well as the status, rights and freedoms of judges, and the documents issued by them, should be of the republic. constitutional and legal norms, which are important for the organization and functioning of the independent judicial power, as they are mandatory for all subjects in the entire territory, have taken place.

Speaking about this, it is appropriate to note that during the years of independence, significant results were achieved in the fundamental reform of the judicial system in our country. In particular, in order to consistently implement the constitutional principle of separation of powers, the Law “On Courts” was adopted in a new version [3].

Criminal-procedural, civil-procedural legislation was seriously reformed. These, in turn, made it possible to remove the courts from the influence of executive authorities and control bodies. If we dwell on the general description of the judicial power of the Republic of Uzbekistan, first of all, it is necessary to analyze the definitions and concepts given to this power institution in the

scientific literature and legislation. Most citizens have a more complete impression of the judiciary than of the legislature and executive. However, it should be noted that there is no unanimity in the legal literature regarding the concept of authority under consideration.

In jurisprudence, up to now, two different approaches defining the content of judicial power can be seen. According to the Russian scientist I.Ya. Foynitsky, who thinks in the first direction, the judiciary “organizes a system of law-abiding bodies called to apply laws in the course of court proceedings” [4].

Yu.A. Dmitriev and G. Cheremnikhs agree with his opinion and evaluate the judicial power as “a system of state and municipal bodies that have the authority to determine the truth, restore justice and punish the guilty, and whose decisions must be executed by officials” [5].

Representatives of the second approach understand the judicial power as the activity of reviewing court cases. S.V. Poznyshev considers the judicial power not to perform the administrative and legislative functions of the state power, but to the bodies that “implement the laws and confirm their rule in life, fight against arbitrariness and violence” [6].

Two important aspects stand out in the concept of judicial power put forward by the supporters of both of the above approaches. The first is substantive, according to which judicial power is evaluated as the authority to resolve disputes in society using a specially established procedure. The second is organizational, which is evaluated by the fact that these powers belong only to the courts. It would be absurd to oppose these two aspects [7].

Despite the fact that this definition is simple and understandable, it does not express the important function of the judiciary in most countries, the task of exercising constitutional control [8].

Different approaches to judicial power in legal literature must meet the requirements of the current level of normative legal practice. Therefore, it is necessary to give a general scientific definition to the concept of judicial power, not in terms of its decision-making, functions, forms and principles of activity, but in terms of its essence and content of activity, social function and place in society.

Judiciary is a part of the judicial system of the state and has certain state powers by the courts that consider and resolve legal disputes arising between legal entities in any sphere of society regulated by law, influencing their behavior, forming a legal environment in society, and other forms of authority. is a separate, independent and impartial branch of state power aimed at ensuring their balance and confirming the rule of law in society by actively influencing the decisions and actions of its two branches [9].

The judicial system in our country is the Constitutional Court of the Republic of Uzbekistan; Supreme Court of the Republic of Uzbekistan; military courts; Court of the Republic of Karakalpakstan, regional and Tashkent city courts; Administrative Court of the Republic of Karakalpakstan, administrative courts of regions and Tashkent city; interdistrict, district, city courts for civil cases; district and city courts for criminal cases; interdistrict, district, city economic courts; consists of inter-district administrative courts [10].

Judiciary is a part of the judicial system of the state and has certain state powers by the courts that consider and resolve legal disputes arising between legal entities in any sphere of society regulated by law, influencing their behavior, forming a legal environment in society, and other forms of authority. is a separate, independent and impartial branch of state power aimed at ensuring their balance and confirming the rule of law in society by actively influencing the decisions and actions of its two branches [11].

Along with the above, in the Republic of Uzbekistan, courts can be specialized according to the categories of cases. It is important to note that it is not allowed to create emergency courts. The Constitutional Court has a special place in the system of judicial power of the Republic of Uzbekistan. In particular, the Constitutional Court is a state body authorized to hear cases on the compliance of legislative and executive power documents with the Constitution [12].

Another important aspect of the new version of the Constitution of the Republic of Uzbekistan is that now the legal status of the Supreme Council of Judges of the Republic of Uzbekistan, the order of its powers and activities have been recognized at the constitutional level. the role of this body in the life of the judiciary is incomparable. After all, the Supreme Council of Judges of the Republic of Uzbekistan is a body of the community of judges, which helps to ensure compliance with the constitutional principle of independence of the judiciary in the Republic of Uzbekistan. Based on this, the legal status of the Supreme Council of Judges and the main areas of activity were defined as follows:

The Supreme Council of Judges of the Republic of Uzbekistan is an independent body of the judicial community, which ensures the formation of the corps of judges and the observance of the constitutional principle of independence of the judiciary [13].

The chairman of the Supreme Council of Judges of the Republic of Uzbekistan and his deputy are elected for a five-year term by the Senate of the Oliy Majlis of the Republic of Uzbekistan on the recommendation of the President of the Republic of Uzbekistan. The same person cannot be elected as the chairman or deputy chairman of the Supreme Council of Judges of the Republic of Uzbekistan for more than two consecutive terms. The organization of the Supreme Council of Judges of the Republic of Uzbekistan and the order of its activity shall be determined by law.

Based on the above, the Supreme Council of Judges of the Republic of Uzbekistan performs the following tasks, which are extremely important for the judicial system of the Republic of Uzbekistan:

formation of a corps of judges based on selection of candidates for judicial positions, appointment of judges from among the most qualified and responsible specialists, as well as recommendations for appointment to leading judicial positions;

According to Article 135 of the newly revised Constitution of the Republic of Uzbekistan, judges are independent and subject only to the Constitution and the law.

It is not allowed to interfere with the activities of judges in the administration of justice in any way, and such interference is a cause of responsibility according to the law. A norm was established that judges are not accountable for certain cases. A number of systematic works are being carried out for effective functioning of this constitutional norm. In particular, the Department of Ensuring the Courts operates under the Supreme Court of the Republic of Uzbekistan.

According to the Regulation on the Department of Courts under the Supreme Court of the Republic of Uzbekistan, the Department under the Supreme Court is a state body that performs the functions of material and financial support of the courts [14].

The Department under the Supreme Court is under the departmental authority of the Supreme Court of the Republic of Uzbekistan and reports on its activities to the chairman of the Supreme Court of the Republic of Uzbekistan. The establishment of this Department under the Supreme Court is one of the important reforms introduced to ensure the principle of judicial independence in practice.

But there is still work to be done in this regard, because in our opinion, further reform of the judicial system, strengthening of the guarantees of effective protection of the rights and freedoms of citizens

We believe that it is appropriate to pay attention to the following main priorities in order to raise the quality of reforms in this area to a new level in order to further increase the trust in the court:

- the legal, organizational, procedural and material-technical basis for the sector should be strong;
- Ensuring the true independence of the judiciary based on the tasks defined in the “Uzbekistan-2030” strategy;
- to further strengthen legal guarantees of effective protection of rights and freedoms, legal interests of citizens, business entities and foreign investors;

- increase the level of access to justice.

But reforms in the judicial system are not an event that can be quickly implemented in a short period of time, but are part of the modern requirements of the judicial system

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Rezyume: *Mazkur maqolada Yangi O‘zbekiston taraqqiyot davrida sud huquq isloxtolarining yangi rivojlanish bosqichida fuqarolarning huquq va erkinliklari va konuniy manfaatlarini samarali himoya qilish. odil sudlovni amalga oshirishda avvalo ilmiy adabiyotlarda mustaqil sud hokimiyati institutiga berilgan ilmiy ta’rif va tushunchalarga aniklik kiritilib, bugungi kunda sud xokimiyatining roli va ahamiyati hamda odil sudlov tizimini yanada takomillashtirish masalalari tadqiq etilgan.*

Резюме: *В данной статье рассматривается эффективная защита прав и свобод и законных интересов граждан на новом этапе развития реформ судебного права в период становления Нового Узбекистана. в осуществлении правосудия, прежде всего, были уточнены научные определения и понятия, данные институту независимой судебной власти в научной литературе, исследованы роль и значение судебной власти, вопросы дальнейшего совершенствования системы правосудия.*

Kalit so‘zlar: *mustaqil sud hokimiyati, sud tizimi, odil sudlov, “O‘zbekiston-2030” strategiyasi, “Xalqshil sud” tamoyili, sud, konstitutsiyaviy sud, Oliy sud, sudyalor maqomi, munitsipal organlar tizimi.*

Ключевые слова: *независимая судебная власть, судебная система, система правосудия, стратегия «Узбекистан-2030», принцип «международного суда», суд, конституционный суд, Верховный суд, статус судей, система муниципальных органов.*

IS THERE LEGAL LIABILITY UNDER A PRELIMINARY AGREEMENT?

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Summary: *Understanding a preliminary agreement is connected with grasping the essence and principles of the rules related to it. This article analyzes the essence and necessity of the preliminary agreement. The proposed research provides comprehensive information about the emergence of the preliminary agreement, its necessity, application areas, legislative disputes, judicial and law enforcement practices, and trends in problem-solving. In recent years, the approaches to drafting and interpreting preliminary agreements, as well as compelling the conclusion of the main contract based on the preliminary agreement, have been studied in Uzbekistan and globally. Moreover, the need to adapt Uzbekistan's legislation to international requirements for legal regulation of contractual relations is highlighted. The article extensively studies the scientific perspectives of scholars and the legislation of the Republic of Uzbekistan during the development strategy period. The author proposes specific suggestions and ideas.*

Keywords: *contract, preliminary agreement, pre-contract negotiations, option, subject of the contract, essential terms, liability.*

Do We Have Legal Rights and Obligations Concerning the Main Contract?

Naturally, issues of legal liability arise if the terms of this contract are not fulfilled timely or adequately. However, there are no unanimous opinions regarding the emergence of civil-legal liability in cases where a preliminary agreement has been concluded. There is a necessity for active application of the preliminary agreement in various spheres of social life.

The Civil Code Establishes a Rule Regarding Preliminary Agreements:

According to it, under a preliminary agreement, the parties undertake to conclude a contract (main contract) in the future on the transfer of property, performance of work, or provision of services on the terms provided for by the preliminary agreement (Civil Code, Article 361).

The Main Characteristics of a Preliminary Agreement Are As Follows:

1. The obligation to conclude the main contract arises. The parties undertake to conclude the main contract, indicating its essential terms in the preliminary agreement.
2. The issue of the form of the contract must be resolved. The preliminary agreement must be concluded in the same form as the main contract. For example, if the main contract requires notarization, the preliminary agreement must also be notarized.
3. The term for concluding the main contract must be clearly defined. The preliminary agreement usually specifies the period within which the parties undertake to conclude the main contract. If no term is specified, the main contract must be concluded within one year from the date of the preliminary agreement (Civil Code, Article 361).
4. The consequences of non-performance or improper performance of the contract arise. If one party refuses to conclude the main contract, the other party may apply to the court to compel the conclusion of the contract or to claim damages caused by the non-performance.

The Concept of Pactum de Contrahendo:

This concept existed in Roman law and was known in 19th-century German law. Pre-contract negotiations were regarded as pre-agreed. The parties mutually compelled each other to undertake certain actions voluntarily. It was a legal construct not supported by an official claim. When it took the form of stipulatio, it was supported by a claim, such as the delivery of property, payment of money, etc.

In Which Areas are Preliminary Agreements Concluded?

1. Real estate sale and purchase agreements, where the parties wish to conclude the contract but cannot do so immediately, for example, when an heir has not yet accepted the inheritance.
2. Contracts between entrepreneurs, requiring significant transactions regarding goods and services.
3. Preliminary agreements allow parties to clarify their intentions and reduce various risks.

The Relationship Between Preliminary Agreement and Pre-Contract Negotiations:

The Civil Code defines the preliminary agreement as an obligation. It means it must be executed upon one party's demand. However, the Civil Code does not establish specific rules regarding pre-contract negotiations. When interpreting the terms of a contract, the true common will of the parties must be determined, considering the purpose of the contract, negotiations, correspondence, established practices, business customs, and subsequent conduct of the parties (Civil Code, Article 363).

The Importance of Legal Advisors in Pre-Contract Negotiations:

Lawyers play a crucial role in ensuring the actions of their partners comply with legal requirements and align with corporate interests. They help shape the positions of negotiation participants and assess legal actions at each stage of negotiations.

The Distinction Between Preliminary Agreement and Option:

An option differs from a preliminary agreement. According to Article 23 of the Law of the Republic of Uzbekistan "On Exchanges and Exchange Activities," option agreements can be concluded for the future purchase or sale of goods or delivery contracts at a specified price. In an option, the main contract is considered concluded, with the primary obligation deferred until required.

Additional Obligations in Preliminary Agreements:

Preliminary agreements may specify obligations such as ensuring the occurrence of a delayed condition, providing information on certain events, adhering to negative obligations until the main contract is concluded, coordinating actions with the other party, eliminating restrictions, and obtaining third-party consent.

Legal Liability Under a Preliminary Agreement:

The obligation to conclude the main contract exists. If one party refuses to conclude the main contract, the other party is entitled to claim damages. It is possible to compel the conclusion of the main contract through the court. The preliminary agreement may provide for liability, such as penalties for refusal to conclude the main contract.

Rezyume: Dastlabki kelishuvni tushunish unga tegishli qoidalarining mohiyati va tamoyillarini tushunish bilan bog'liq. Ushbu maqolada dastlabki kelishuvning mohiyati va zarurligi tahlil qilinadi. Taklif etilayotgan tadqiqot dastlabki kelishuvning paydo bo'lishi, uning zaruriyati, qo'llanish sohalari, qonunchilikdagi nizolar, sud va huquqni qo'llash amaliyoti, muammolarni hal etish tendentsiyalari haqida to'liq ma'lumot beradi. So'nggi yillarda O'zbekistonda va jahon miqyosida dastlabki shartnomalar loyihasini ishlab chiqish va sharhlash, shuningdek, dastlabki kelishuv asosida asosiy shartnomani tuzishga majburlash yondashuvlari o'rganilmoqda. Bundan tashqari, O'zbekiston qonunchiligini shartnomaviy munosabatlarni huquqiy tartibga solish bo'yicha xalqaro talablarga moslashtirish zarurligi ta'kidlangan. Maqolada olimlarning ilmiy qarashlari va rivojlanish strategiyasi davridagi O'zbekiston Respublikasi qonunchiligi keng o'rganilgan. Muallif aniq taklif va g'oyalarni taklif qiladi.

Резюме: Понимание предварительного договора связано с усвоением сущности и принципов правил, связанных с ним. В данной статье анализируются сущность и необходимость предварительного договора. Предлагаемое исследование дает исчерпывающую информацию о возникновении предварительного договора, его необходимости, сферах применения, законодательных спорах, судебной и правоприменительной практике, тенденциях решения проблем. В последние годы в Узбекистане и мире изучаются подходы к составлению и толкованию предварительных договоров, а также понуждения к заключению основного договора на основе предварительного договора. Кроме того, подчеркивается необходимость адаптации законодательства Узбекистана к международным требованиям правового регулирования договорных отношений. В статье подробно исследуются научные взгляды ученых и законодательство Республики Узбекистан в период стратегии развития. Автором предлагаются конкретные предложения и идеи.

Kalit so'zlar: shartnoma, dastlabki kelishuv, shartnomadan oldingi muzokaralar, option, shartnoma predmeti, muhim shartlar, javobgarlik.

Ключевые слова: договор, предварительный договор, преддоговорные переговоры, опцион, предмет договора, существенные условия, ответственность.

IS PARALLEL IMPORT PERMISSIBLE IN INTELLECTUAL PROPERTY?

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Summary: *This article investigates the legal nature and admissibility of parallel imports concerning intellectual property objects. The focus is on analyzing international and national regulatory documents governing this issue. The author considers the arguments for and against parallel imports, identifying potential consequences for rights holders, consumers, and the market as a whole. As a result of the analysis, recommendations are made to improve the legal regulation of parallel imports to achieve a balance of interests for all stakeholders.*

Keywords: *parallel import, intellectual property, legal regulation, international law, national law, absolute rights, consumers, market.*

Content:

Recent global events have made the issues of economic laws, establishing trade relations, and ensuring property rights even more urgent. While it may seem that there are no problems at first glance, in reality, ensuring the rights and legitimate interests of absolute rights holders concerning intellectual property objects has become important.

Industrial property objects must align with the interests of the rights holder in civil transactions. However, in some cases, these interests are not met. For example, under parallel import, legal goods, including trademarks, patents, copyrights, etc., cross borders and enter other countries' markets without the rights holder's consent. This often happens with high-priced or well-known goods, leading to price differences in various countries' markets.

Parallel import involves importing original goods from abroad without the rights holder's consent. Some experts believe that parallel import is highly beneficial for the pharmaceutical market, making markets more saturated. For instance, Russia heavily relies on foreign pharmaceuticals, with imports constituting 70% of the market.

Parallel import usually operates under the principle of the exhaustion of rights concerning an intellectual property object. For example, if a product has been introduced into commercial circulation once, the company holding the absolute right loses control over the product's future. Typically, when property is sold, ownership rights transfer from one person to another. Absolute rights over an object cease once ownership rights transfer. Usually, the exhaustion of rights concerning a copyright object is an exception to the general rule, with any actions related to the use of the work requiring the rights holder's consent. Therefore, one of the cases of free use of a work is the exhaustion of absolute rights over the work.

Negative Impact:

The negative impact of parallel imports cannot be ignored. The main adverse effect is its ability to promote free trade and competition. The absence of parallel imports can create a situation where manufacturers control market monopolies, leading to higher prices. Parallel import can offer lower-priced goods, but it may not ensure the expected quality, service, and satisfaction. Moreover, parallel import can lead to significant revenue loss for rights holders.

It should be noted that parallel import does not violate copyright or patent rights, as goods crossing borders are legally brought into the country by the copyright holder or their official distributor. However, parallel import raises some questions and issues.

Goods brought in through parallel import may be sold at lower prices compared to similar goods in the domestic market. This creates competitiveness issues for official distributors and rights holders who sell at higher prices. Quality control can also be affected, as goods may enter the market without proper oversight from the rights holder or their official distributors. Additionally, rights holders often develop special marketing strategies for different countries, which parallel import can disrupt, making market control challenging.

Parallel import can also cause conflicts between rights holders and their official distributors, as their efforts in distributing goods may not pay off. This, in turn, affects the management of intellectual property and the allocation of rights over goods. Today, parallel import is observed in various fields, including pharmaceuticals, electronics, automobiles, clothing, and many others.

Licensing Intellectual Property:

One of the key functions of licensing intellectual property is overcoming various barriers for subjects to operate effectively in this field. In other words, an entrepreneur without a license must create a completely new product or service that does not infringe on others' intellectual property rights. Signing a license agreement is considered the best option for effectively using intellectual property. Such licensing can be done through individual negotiations, cross-licenses (where each party grants parallel licenses to the other), or joint licensing of rights from multiple owners within the scope of licensed intellectual property.

According to V. Yakupov, the main difference between a contract for the disposal of exclusive rights and a license agreement lies in the method of exercising control over the exclusive right. Legislation clearly indicates that entering into a license agreement does not transfer the absolute right to the licensee. When a license agreement is concluded, the absolute right remains with the licensor. This view neglects the provision that a license agreement can be concluded in two forms, allowing for full or partial transfer of absolute rights.

Nevertheless, V. Yakupov includes contractual forms for alienation of exclusive rights in his classification: a contract for the disposal of exclusive rights; a contract for the sale of an enterprise; an inheritance contract; a contract for the establishment of an economic partnership or company (when exclusive rights are included in the charter fund). However, civil law contracts are not limited to these and can include other contracts such as purchase and sale, pledge, and more.

V.O. Kalyatin believes that when a license agreement is concluded, the licensee is granted a non-exclusive right (the original right remains with the owner), providing a secondary right of use. In contrast, E.S. Grin considers the copyright order contract not as a contract for the disposal of exclusive rights but as a contract for the creation of a new work.

O.A. Ruzakova proposes dividing contracts for the transfer of an item as property and contracts for the disposal of exclusive rights into six types. The author does not delve into the essence of the item or the creative work but applies the usual rules and criteria for goods.

Some authors argue that transferring part of a patent formula under a contract is impossible. In such cases, all powers previously held by the rights holder become the property of the purchaser. Others point to the existence of various contract options, suggesting that the full transfer of exclusive rights is possible. Consequently, they conclude that it is not possible to transfer a specific part of the invention formula or retain an essential feature of an industrial design with the rights holder.

P.P. Battakhov argues that the law provides the possibility for the inventor to publicly offer a contract for the disposal of a patent (Articles 1366 and 1427 of the Civil Code of the Russian Federation). This means that a contract offer can be publicly made and concluded while notifying the authorized state body.

In our opinion, the legislation here refers to the possibility of concluding an open license agreement. Its essence lies in allowing the patent holder to make this contract offer. The offerer must conclude a non-exclusive license agreement. Such an offer is a one-time action and cannot be withdrawn (Article 33 of the Law).

According to M.V. Telyukina, parties must express their agreed will to conclude a contract. In this case, the rules regarding real transactions contradict the essence of legislation. E.P. Gavrillov believes that concluding a real license agreement is impossible since such agreements require the delivery of a material object and do not allow for rights over an intellectual property object. P.P. Battakhov disagrees, arguing that it is incorrect to claim the impossibility of concluding a real license agreement by referring to the immateriality of intellectual property objects, including industrial property objects.

In our opinion, the possibility of concluding and executing a license agreement does not directly depend on specific legal features of the agreement. Instead, compliance with the terms of the agreement aligns with mutual interests. Furthermore, legal sanctions ensure appropriate conduct and proper fulfillment of obligations.

Important Conditions of a License Agreement:

The main subject and specific methods of using the object are crucial terms of a license agreement. It should be noted that the absence of any specific method of use in the agreement does not prohibit the licensee from using the object in ways not specified in the agreement. The licensee can use the object according to methods not mentioned in the agreement.

Types of Licenses:

Absolute license, non-absolute license, open license, compulsory license, and secondary (sub) license agreements differ from each other. The territory and duration of use should be specified in the license agreement. The presence of important conditions is required in a license agreement. Our national legislation also sporadically reflects the possibility of concluding such agreements.

P.P. Battakhov suggests classifying methods of using industrial property objects from the perspective of direct and indirect use. According to him, indirect use of industrial property objects occurs when they are not directly objects of commercial contracts but are indirectly introduced into commercial circulation. The copyright holder uses them in their economic activities (e.g., through participation in business). Direct use of industrial property objects involves their introduction into commercial circulation through various commercial contracts (e.g., license agreements, contracts for the disposal of patents, commercial concessions, pledges, etc.).

Conclusion.

In conclusion, a unique approach to parallel import can be observed. First, the absolute rights holder initially introduces the object into commercial circulation (e.g., sells it). Second, an entrepreneur from a specific country purchases the object under a contract and brings it into the country. Third, although certain documents such as quality authenticity documents may be presented at customs, a specific permit regarding the rights holder's consent is not provided. After that...

Rezyume: *Ushbu maqola intellektual mulk ob'ektlariga nisbatan parallel importning huquqiy tabiati va ruxsat etilishini o'rganadi. Bu masalani tartibga soluvchi xalqaro va milliy me'yoriy hujjatlarni tahlil qilishga asosiy e'tibor qaratilgan. Muallif parallel importni qo'llab-quvvatlovchi va unga qarshi dalillarni ko'rib chiqadi, huquq egalari, iste'molchilar va umuman bozor uchun mumkin bo'lgan oqibatlarini aniqlaydi. Tahlillar natijasida barcha manfaatdor tomonlar uchun manfaatlar muvozanatiga erishish uchun parallel importni huquqiy tartibga solishni takomillashtirish bo'yicha tavsiyalar ishlab chiqilmoqda.*

Резюме: *В статье исследуются правовая природа и допустимость параллельного импорта в отношении объектов интеллектуальной собственности. Основное внимание уделяется анализу международных и национальных нормативных документов, регулирующих данный вопрос. Автор рассматривает аргументы «за» и «против» параллельного импорта, выявляя возможные последствия для правообладателей, потребителей и рынка в целом. В результате анализа даются рекомендации по совершенствованию правового регулирования параллельного импорта для достижения баланса интересов всех заинтересованных сторон.*

Kalit so'zlar: *parallel import, intellektual mulk, huquqiy tartibga solish, xalqaro huquq, milliy huquq, mutlaq huquqlar, iste'molchilar, bozor.*

Ключевые слова: *параллельный импорт, интеллектуальная собственность, правовое регулирование, международное право, национальное право, абсолютные права, потребители, рынок.*

**IDENTIFICATION, DIAGNOSIS AND REHABILITATION OF CHILD VIOLENCE
SIGNS: SOCIOLOGICAL ANALYSIS**

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Summary: *The article examines international norms and definitions of the socio-legal status of children in national legislation, theoretically substantiates the fact that children are a generation that ensures the continuity of social life as part of the population. It also scientifically analyzes the fact that violence against children occurs as a social phenomenon in society, factors and conditions that cause violence. In addition, the essence of "Mobbing", "Bullying", "Cybermobbing" and "Cyberbullying" as traditional forms of violence against children is revealed, and the author's approaches to preventing violence against children are highlighted.*

Keywords: *children, violence, sexual, psychological, physical and emotional violence, bullying, mobbing, hazing, cybermobbing, cyberbullying, child neglect.*

Introduction.

In determining and diagnosing the type, form, methods and manifestations of violence against a person, some aspects of violence against children and youth are distinguished. By person, we mean a person who has successfully passed the stage of socialization, has a special status, position, role and place in social groups and social classes, and has individual characteristics. Since children and young people have not fully passed these socialization processes, they cannot be called full-fledged individuals. The reason is that children and young people cannot fully express themselves as individuals in the society, using their limited social position in the society.

President Shavkat Mirziyoev says in this regard: "A child is a deposit in the hands of parents," say our great scholars. Today's life proves in every way that our children, their fate and future are really a great investment. If we do not give our children a proper upbringing, if we do not keep an eye on their behavior and mood every day, if we do not teach them science and technology, if we do not find a decent job, then we will lose this it [1.480] .

Results and Discussion

Implementation of the requirements of the Convention "On the Rights of the Child" to a full life, guaranteeing the rights of children provided for in the Constitution of the Republic of Uzbekistan, the Family Code and other laws, ensuring that they grow into a physically, intellectually, mentally and spiritually mature generation, as well as for the years 2022-2026 One of the main tasks in the field is to effectively ensure the implementation of the tasks defined in the Development Strategy of New Uzbekistan.

By the decision of the President of the Republic of Uzbekistan dated April 22, in 2019 year №PQ4296 "On additional measures to further strengthen the guarantees of children's rights". It was determined that changes and additions should be introduced and according to the law, the types of oppression and violence used against the child were also about its prevention [2].

By child abuse we mean cruelty to children, physical and emotional abuse, sexual abuse, neglect, indifference to them, trafficking in children, use of child labor, their health, survival, development or dignity. actions such as preventing them from happening can be cited. According to the World Health Organization, child abuse is a global problem with serious lifelong consequences [3].

The procedure for determining the status of a child in international legal documents was first established in the "Geneva Declaration of the Rights of the Child" dated November 26, in 1924 year. » is identified [4.14].

Article 1 of the Convention on the Rights of the Child, adopted by the United Nations on November 20, in 1989 year, states that "every person under the age of 18 years is considered a child if, according to the law applicable to the child, he or she has not reached the age of majority earlier [5].

In our national legislation, on January 7, in 2008 year, Article 3 of the Law of the Republic of Uzbekistan "On Guarantees of Children's Rights" states that "Child (children) is a person (persons) who have reached eighteen years of age (adulthood) [6].

In Uzbekistan, the initial work on the protection of children and ensuring the guarantees of children's rights began with the 757-XII accession to this convention on December 9, in 1992 year, with the decision of the Supreme Council of the Republic of Uzbekistan "Joining the Convention on the Rights of the Child" on December 9, in 1992 year [7].

As for the issue of youth, Article 4 of the Law of the Republic of Uzbekistan "On State Policy Regarding Youth" dated November 20, in 1991 year defines youth as citizens between the ages of 14 and 30. This law was amended on September 14, in 2016 year, in which, although there were no changes in the age limit of young people, the concepts of young family, young professional youth entrepreneurship were included in this law [8].

In articles 3, 10 and 16 №-139 of the Law of the Republic of Uzbekistan on January 07, in 2008 year "On Guarantees of Children's Rights", it is possible to see the articles on the protection of children from various forms of violence. In particular, Article 3 of this law includes abused children in the group of children in need of social protection. Article 10 states that "The state ensures the privacy of the child's identity, home, and correspondence, and protects the child from all forms of exploitation and abuse, including physical, mental, and sexual abuse, torture, or other forms of cruel, harsh, or degrading treatment." implements protection from abuse, sexual harassment, involvement in committing crimes and antisocial acts" and Article 16 "From pornography, mass media that show cruelty and violence, insult human dignity, have a harmful effect on children and cause crimes to be committed use, distribution of literature and screening of films are prohibited" [9].

This law was adopted seventeen years after independence. However, it should also be noted that until now, the issue of violence against children has only been dealt with in the articles of the Criminal Code, Criminal Procedure Code and Code of Administrative Responsibility. This may restore the violated rights of the abused child. However, due to the lack of norms for the protection of children from such violence, in 2008 year, the Law of the Republic of Uzbekistan "On Guarantees of Children's Rights" was adopted, and a separate law aimed at protecting children from various forms of violence and guaranteeing their rights was adopted in our country.

Due to the fact that the forms of violence against children have changed over time, this in 2008 year Law of the Republic of Uzbekistan "On Guarantees of Children's Rights" was adopted in a new version on March 11, in 2020 year, with additions and amendments. With the adoption of the new version of this law, no changes or additions were made to the text of the articles that list the types of violence against children.

Reviewing the social history of violence against children in the family and society allows for a clearer understanding of the causes of this phenomenon and the essence of the problem, sociological analysis and synthesis of interpretations and views on violence against children. Is a part of population, the phenomenon of violence against children is one of the social evils in the society that has been going on for a very long time.

In our opinion, the initial view of studying the historical and sociological aspects of the problem of child abuse is to look at infant mortality from the initial stage of child abuse. It is known from the history of mankind that facts such as the deliberate killing of newborns in primitive societies or the execution of male infants as sacrifices to gods and goddesses, and the killing of children during food shortages indicate that the history of violence against children is very ancient.

In ancient Sparta, a special authority examined all newborns to determine their health and usefulness to society. As a result of such an examination, boys were found "unfit" to live, and

children born with physical defects and disabilities were sentenced to death. Also, in ancient Roman law, this condition strictly prohibited the raising of children with physical defects or disabilities in the family. It is a remarkable fact that even enlightened people such as Hippocrates and Soran of Ephesus, the founder of gynecology, discussed the question of which newborns deserve to be educated and educated [10. 447].

In ancient Roman law, children were considered the property of their parents, and until the child reached adulthood, it was considered an inferior being, the result of sexual relations, it was literally the property of the parents, mainly the father. This rule adopted from Roman law was called (*patria potestas* - strict parental authority), and the child was completely at the mercy of his parents. A father has the right to use his child as an employee, property, and use force and punishment at will.

In our opinion, the opposite of child cruelty in the West can be seen in the East. In particular, it is envisaged that the child should be given all the love of his parents so that he will be the successor of the generation and the owner of tomorrow. In Eastern countries, especially in Movarounnahr, China, Khorasan, Egypt, it is not important how a child is born, regardless of whether he is born healthy or with a physical defect, his status as a child has not changed and the child is not considered the property of the parents. A child is considered to be an object of socialization and a person in the future, as well as a being born with the right to live. We can find such situation in Avesta, Confucian views, Indian Vedas, Bible, Holy Quran and Hadith. In some Arab countries, violence against girls born in the period of pre-Islamic ignorance, such as burying alive and sacrificing boys to idols and idols, was completely eliminated with the introduction of Islam.

While some modern forms of child abuse and harassment are referred to as bullying, mobbing, hazing, cyberbullying and cybermobbing, these terms are generally used as synonyms for child abuse. Interpretation of these concepts from the point of view of sociology allows to distinguish their different aspects.

We considered it necessary to quote the following rule as an author's interpretation of the concept of violence against children. Child abuse is cruel treatment of a child, neglect of a child, lack of love in the relationship between a child and a parent, actions that harm the physical and mental health of the child, his development and peace of mind, as well as limit his rights or freedom, or It is inactivity caused by neglecting to provide housing and food necessary for development, health and growth, education, and living .

Child abuse also includes the concept of "Persecution", which is psychological or physical violence aimed at forcing children to submit to or leave the dominant group (leader) and its in-group laws. Such cases are mostly found in preschool educational institutions, schools, orphanages, family children's homes (Foster care), educational colonies, sports schools, hospitals, camps and also in various institutions where children stay. There are forms of harassment such as gossiping, slandering, scaring, isolating, insulting, humiliating, and coveting [11.147].

The English term child molestation is used as a universal term in sociology and social work as "Mobbing", "Bullying", "Hazing", "Cybermobbing" and "Cyberbullying". Bullying means belligerent, hooligan, bully, bully, bully, violent, and it is a repeated situation of violence and persecution by one person against a weak person who cannot defend himself [12.150].

Therefore, bullying is always aimed at harming the child, instilling fear in him, depressing him, humiliating him, subjugating him to himself. In educational institutions, bullying is a common phenomenon among peers, bullying is often perpetrated by older students against younger students. This type of bullying can also be used by teachers, staff or management of educational institutions. Bullying can also occur in the family between older and younger children, between adopted and foster children, and between children of the father or mother.

Mobbing (eng. mobbing - crowd) is a form of psychological violence in the form of mass persecution of a child by a large group of children in a community. In mobbing, those who cause harm are called mobbers, and those who are harmed are called "victims". The manifestation of

mobbing among young people and adults is different from that of children, and it is described as a kind of "Psychological terror" that involves regularly repeated hostile and unethical behavior of one person directed against another person. The forms of mobbing among young people and adults are manifested in the form of laughing at physical defects, isolation, denial, touching, pushing, making fun of clothes, not talking and who cannot defend himself. Bullying is distinguished from mobbing by the performance of a specific student or group of students who have the authority, rather than the whole class, in the role of the bully [12.151].

Hazing (eng. hazing) is the application of a series of tests by the leaders of the group hierarchy as conditions for the acceptance of a child into this group in order to become a member of a particular group. In hazing, probation conditions are considered child abuse. In this case, the child has to commit a crime, steal, do something against his will, run away from home or perform some phenomenal task. Such manifestations of hazing occur among neglected children, gangs of bullies, correctional institutions and children's organizations. The most negative aspect of hazing is that almost 70% of children who are victims of hazing violence die due to inexperience.

There are forms of cruel and violent treatment of children, such as physical, sexual, psychological violence and neglect of the child's needs, exploitation. Child abuse can be classified according to a number of parameters depending on the occurrence:

- overt or covert violence;
- violence related to the behavior of the abuser;
- current or past violence;
- violence lasting once or several times over many years [13.17].

Physical violence against children means harming the child's health by parents or their substitutes, guardians, sponsors, educators, teachers, coaches, nannies, caregivers, social worker assistants, group leaders or persons whose work activities are related to children. Its development is causing various injuries and injuries to the body that destroy physical and mental health. These actions include hitting, torturing, shaking, suffocating, putting in water, pulling hair, hitting with an object, slapping the face, burning with hot objects, pressing on smoked tobacco, sticking a needle, biting, giving psychotropic substances, drinking alcohol, eating it is manifested in the form of not giving, leaving naked, punishing the child for defecating, taking him outside on cold days, doing things the child cannot do, lifting heavy loads. It can also be done by scaring the child with various objects as a tool of humiliation [14.212].

Child sexual abuse is a form of cruel treatment of a minor child by an adult or another child by tricking or coercing them into sexual activities in order to satisfy their sexual needs or for financial gain. Child sexual abuse, sometimes referred to as "Pedophilia", is the attempt or coercion of a minor or sexually immature child to engage in sexual activity [15,195].

Psychological violence against children is constant or occasional verbal abuse, cursing, name-calling, forcing the child to act like an animal or human, forcing him to change his voice, making propaganda that confuses the child about his gender, threatening with various pictures and objects, not sleeping, sleeping a lot, humiliating, humiliating, stigmatizing, dressing contrary to gender, completely isolating the child from the outside world, forcing the child to realize himself as an animal rather than a human [16.101].

Emotional abuse of children is the neglect of the basic needs of the child by parents or their substitutes, and the lack of care for the child results in a disturbance of the child's emotional state and a danger to his health or development. This form of violence can also be described as moral cruelty.

Neglect of children (neglect) is a form of psychological abuse in which a person systematically ignores the vital needs of a dependent victim (child). Child neglect manifests itself in the following forms:

- neglect of food - depriving the child of food or malnutrition;
- carelessness in providing the child with clothes - dressing the child in clothes and shoes that do not correspond to the season or neglecting to dress the child at all;

neglect of hygiene - non-observance of general norms of personal hygiene, violation of the sanitary conditions of the residence that threaten the life or health of the child;

Negligence in medical care - lack or refusal of necessary medical care to protect the child's life, health and physical integrity, failure to vaccinate against various diseases on time, negligence to various disorders in the functioning of the child's internal and external organs, negligence to the fact that the child's body part has stopped developing and changes, rapid not to contact medical personnel in cases;

neglect of education - carelessness in sending the child to kindergarten and school for education and training, carelessness in the child's efforts to acquire school education;

emotional neglect - denial of the child's psychological and emotional problems by parents or their substitutes;

negligent supervision - negligence in unsupervised conditions or situations that could lead to illness, injury, disability or death of a child;

child exploitation is any form of forced labor that endangers a child's health, safety, morals, mental and physical development, including hinders his education. This is mainly manifested in the involvement of children in field work in agriculture, carrying goods, hiring a cart, feeding livestock, begging, cleaning, trading, and digging in mines [16.121].

Conclusions

In conclusion, the types and scope of violence against children are quite wide, and new methods of violence are emerging today. Although the types of child abuse are similar, the difference is that child abuse is committed only by adults. If there is violence between children, then children commit violence without consciously understanding the consequences. Violence against children, if committed by adults, is used for the purpose of getting rid of the child, making the child completely dependent on him, easily controlling the child, intimidating the child, using the child.

We believe that it is possible to prevent and eliminate all forms of violence against children in society. In order to prevent and eliminate violence, communicate with children and young people in a timely manner, strictly establish discipline in the educational masses, effectively organize the cooperative work of the neighborhood group, prevent the spread of alcohol, narcotic drugs, and psychotropic drugs among young people. , can be achieved by preventing the carrying of firearms and cold weapons by young people, protecting them from cyber threats and risks by constantly checking the phones, computers and tablets of children and young people, reducing poverty and ending poverty.

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Rezyume: Maqolada bolalarning ijtimoiy va huquqiy maqomlariga berilgan xalqaro normalar va milliy qonunchilikdagi ta'riflar sharhlar keltirilib bolalar aholining bir qismi sifatida ijtimoiy hayotning davomiyligini ta'minlovchi avlod ekanligi nazariy asoslantiriladi. Shuningdek, bolalarga nisbatan qo'llanilgan zo'ravonlik jamiyatda ijtimoiy hodisa sifatida ro'y berish=0s i, zo'ravonlikni keltirib chiqaruvchi omillar va sharoitlar ilmiy tahlil qilinadi. Bundan tashqari bolalarga nisbatan qo'llanilgan zo'ravonlik an'anaviy ko'rinishlari sifatida «Mobbing», «Bulling», «Kibermobbing» va «Kiberbulling» ko'rinishlarining mohiyati ochib beriladi va bolalarga nisbatan zo'ravonlikni oldini olish borasida mualliflik yondashuvlar yoritilgan.

Резюме: В статье рассматриваются международные нормы и определения социально-правового положения детей в национальном законодательстве, теоретически обосновывается тот факт, что дети являются поколением, обеспечивающим непрерывность социальной жизни как часть населения. Также научно анализируется тот факт, что насилие в отношении детей происходит как социальное явление в обществе, факторы и условия, вызывающие насилие. Кроме того, раскрывается сущность «Моббинга», «Буллинга», «Кибермоббинга» и «Кибербуллинга» как традиционных форм насилия в отношении детей, а также освещаются авторские подходы к предотвращению насилия в отношении детей

Kalit so'zlar: bolalar, zo'ravonlik, jinsiy, psixologik, jismoniy va iqisodiy zo'ravonlik, bullying, mobbing, xeyzing, kibermobbing, kiberbulling, bolaga beparvo munosabat.

Ключевые слова: дети, насилие, сексуальное, психологическое, физическое и эмоциональное насилие, буллинг, моббинг, дедовщина, кибермоббинг, кибербуллинг, безнадзорность детей.

**PROMISING AVENUES FOR ADVANCING TERMINOLOGICAL STUDIES
(HISTORICAL ANALYSIS)**

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Summary: *The article examines the present condition of terminology and its connections with other pertinent fields within contemporary linguistics. The analysis reveals that terminology impacts language policy and language planning. It is highlighted that, in contrast to everyday vocabulary, specialized professional terminology is deliberately and consciously developed. It is demonstrated that by regulating language processes within industry-specific terminologies, it is possible to intentionally influence the evolution of language and its functional capacities.*

Key words: *intercultural professional communication, term, language, special vocabulary, internationalization and harmonization of terminologies, policy, terminology.*

INTRODUCTION. At the start of the 21st century, terminological studies have become prominent in linguistic research due to various sociolinguistic factors. This prominence is clearly linked, firstly, to the increasing specialization of scientific fields, and secondly, to the rapid growth of all forms of intercultural (including professional) communication.

An analysis of recent Russian terminological publications reveals that the primary topics of discussion are general and well-trodden issues, such as the status and characteristics of terms (extensively discussed and settled in the 1960s-80s); the distinction between notions and concepts (established at the beginning of this century); and the variation in the form and content of terms (a well-known aspect of Russian terminology), among others.

It is worth noting that the highly promising studies in typological terminology from the late 20th century have almost entirely ceased. In our view, rather than re-defining already established concepts and terms, efforts should be directed towards identifying the extent of terminological properties in various areas of specialized vocabulary to clarify the typology of terms and terminologies.

We believe that at present the most promising areas of development of special studies include diachronic, comparative and applied research, which are respectively within the framework of diachronic, comparative and applied terminology.

METHODOLOGY. The methodology for this research involves a comprehensive analysis of specialized vocabulary development through literature review, data collection, and trend analysis. We reviewed key texts and recent studies on language policy and terminological practices, focusing on the work of leading scholars. Data was collected via qualitative interviews with language experts and quantitative surveys of specialists to identify current practices and challenges. We analyzed terminological trends and case studies in various scientific fields to assess term creation and regulation. Comparative analysis of language planning strategies and practical implementations provided insights into effective approaches. Recommendations were synthesized based on these findings, ensuring validity through triangulation and expert validation.

RESULTS AND DISCUSSION.

Diachronic direction

The diachronic direction includes historical terminology, anthropolinguistics and cognitive terminology.

At present, the main obstacle to the development of research in historical terminology is the tendency of researchers to limit themselves to a descriptive approach when studying the history of individual terminologies, without attempting to identify the main factors influencing their formation and development. Although this direction in terminology was formed in the 1990s, it was preceded by a long period (since the 1950s) of describing the history of the development of various areas of specialized vocabulary. Generalization of some observations made it possible to identify a number of

linguistic and extralinguistic factors influencing the evolution of terminologies, but since then there have been no attempts to continue and develop work in this direction.

Despite its relatively short existence, anthropolinguistics has introduced a new perspective on the general development of terminologies and the role of different types of specialized vocabulary within it. This discipline has enabled the identification of a new class of specialized vocabulary—prototerms, which serve as a bridge between terms and common vocabulary and are expressed through professional vocabulary. Although still limited in number, anthropolinguistic studies have clarified the role of specialized vocabulary in cognition, the evolution of human consciousness, and its culture. These studies have also bridged the gap between common words and terms, as old terminologies often begin with ordinary vocabulary, and have found areas of common interest between terminology and lexicology. Furthermore, anthropolinguistic research has revealed the connection between specific types of vocabulary and the stages of human consciousness evolution, identified the role of major semantic phenomena in cognitive development, and the system of human knowledge and the vocabulary reflecting it. Additionally, these studies have established new connections between terminology and various sciences, including biology, sociology, psychology, political science, and cultural studies.

Given that cognition is a process, cognitive terminology in the past decade has started considering the historical development of terms and concepts. The primary distinction between the anthropolinguistic and cognitive approaches lies in their study focus: the former examines the broad historical changes in specialized vocabulary, which reflect the evolution of the human mind, while the latter concentrates on the national and cultural characteristics of specialized lexical units in individual languages, reflecting the development of national mentalities. In both approaches, reconstructing the past allows us to anticipate the future.

Comparative direction

The significance of the comparative approach lies in its crucial role in terminological translation and the need to harmonize national terminologies. Comparing pre-systematized national terminologies is essential for facilitating scientific translation, as it helps establish the most accurate term correspondences and eliminates redundant translation options in dictionaries. This process will not only enhance the quality of modern specialized vocabulary translation dictionaries but also improve machine translation.

The noticeable increase in international cooperation in science, economics, and culture necessitates faster actions to harmonize the terminologies of the most developed national languages. Developing principles for the harmonization of national terminologies and taking practical steps to maintain their equivalence are vital for facilitating international professional communication among specialists. A key aspect of this harmonization involves the systematic internationalization of terms, which means coordinating the meanings of formally similar terms across different languages to establish their full correspondence.

Harmonizing national terminologies is essential for the collaborative development of specialized vocabulary, particularly in related languages. It becomes necessary to slow down or prevent the narrowing of functions of smaller languages and their displacement by more widespread ones. We believe that harmonizing national terminologies offers an opportunity to use national terms as a source for new lexical forms for emerging concepts in international specialized vocabulary. A distinctive feature of current terminology harmonization is the existence of established and partially ordered terminologies in most developed languages. Therefore, the less developed the national terminology, the easier it is to internationalize through the systematic borrowing of terms.

Applied direction

The applied approach in terminological research should primarily focus on regulating the development of specialized vocabulary as an aspect of language policy. Research in this area has led to the emergence of a new discipline: linguopolitical science.

Language policy.

The issues of language policy and language construction have become increasingly pertinent due to the swift development of various interstate and intrastate social relations (see, for example, [8; 11]).

As E.B. Grishaeva points out, "the study of language functioning in relation to societal development is a significant topic. Practical aspects such as language planning and policy, speech culture, and interdisciplinary and international integration are gaining growing importance" [8, p. 55].

When discussing various aspects of language policy, it is essential to prioritize activities related to specialized vocabulary for several reasons.

It is well-established that the progressive development of a language involves a quantitative increase in its vocabulary, as the lexical level of a language changes more significantly than its other levels. As highlighted in previous publications [6; 7; 15; 16; 20], the expansion of scientific and technical vocabulary far exceeds the growth of common vocabulary. Currently, the number of terms in specific scientific fields (such as chemistry and biology) surpasses the number of common words in the language. For comparison, the largest Russian dictionary, the 17-volume academic Dictionary of the Modern Russian Language, contains approximately 120,000 words, whereas Russian construction terminology alone encompasses over 150,000 lexemes [6, p. 6]. In English, the most comprehensive edition of the Webster's Dictionary includes around 700,000 words, while as of August 2013, scientists had described 1,070,781 insect species, with an estimated total of 2 to 8 million species on Earth. Additionally, the Earth is home to about a trillion different living species, each with its own lexical designation. According to Infoterm, by the early 21st century, over 200 million products were produced in developed countries, each assigned a unique term. While it was once believed that nine out of ten new words were terms, it is now evident that nearly every new word—99 out of 100—is a term.

According to E.B. Grishaeva, "as we entered the third millennium, the work of tsilinguists has intensified, as they strive to predict the future functioning of languages on a global scale with a certain degree of reliability" [8, p. 55]. Consequently, many local spoken languages, which are essentially dialects, might lose their status as languages (possibly an erroneous designation). For instance, in Dagestan, languages such as Chamal, Bagvalin, Botlikh, Godoberi, Bezhtinsky, Khvarshi, Gunzib, Ginukh, Archi, Budukh, and Khinalug—each spoken by fewer than 5,000 people—are likely to be reclassified as dialects rather than languages. Some of these are already categorized as dialects in reference works, and the 2010 census shows that only 5 people identified Ginukh as their native language, 206 named Botlikh, 128 named Godoberi, with no data available for Budukh and Khinalug speakers [2].

Promising directions of language policy and terminology.

Currently, there is a need to establish objective and well-considered recommendations for language policy, based on the analysis of natural language processes and international language interactions. Terminological research should play a crucial role in shaping these recommendations for several reasons.

Firstly, unlike common vocabulary, which is relatively stable and resistant to deliberate changes, specialized vocabulary can be consciously influenced. Terminology results from agreements among specialists on the names used for concepts within a specific field. Thus, specialized vocabulary is one of the few areas of language that can be intentionally modified and managed. For many languages, it is possible to create rules for generating new terms and organizing existing ones. The extensive layer of specialized vocabulary, particularly nomens, can largely be regulated and developed according to established rules.

Secondly, certain linguistic issues, especially those related to semantics, are most evident within specialized vocabulary due to the precise nature of term meanings.

Thirdly, regulating specialized vocabulary supports scientific and technological advancement. The success of research into cognitive processes (especially creative thinking), the study of human civilization's development, and the stimulation of scientific progress heavily relies on addressing various terminological challenges.

Fourthly, an increasing number of terms are becoming part of everyday language. For instance, in the 1960s, an educated person's vocabulary comprised about 30,000 words, which grew to 50-60 thousand words by the 1990s. This expansion is largely due to the influence of specialized vocabulary, particularly technical terms, as a result of mechanization and computerization in daily life.

Finally, modern anthropolinguistic research suggests a correlation between the level of cognitive development and vocabulary size. There may also be a link between the vocabulary size of a national language and the cognitive level of its speakers. Therefore, we believe that a deliberate language policy, especially in terms of language planning, should focus on developing specialized vocabulary.

Language planning.

Language planning, particularly long-term planning, must be grounded in a thorough, systematic analysis of the current state of specialized vocabulary, as well as trends in forecasting language development and setting directions and methods for regulating specialized vocabulary (an example of identifying these trends can be found in [6, pp. 195-204]).

Effective terminological work, a crucial aspect of language policy, requires a systematic approach informed by a deep understanding of the fundamental characteristics of specialized vocabulary.

Organizing terminology has proven to be a challenging task, but experience in this field has led to the development of principles and practical techniques for creating effective terms and nomenclatures. These principles are detailed in the works of P.V. Veselov [1], V.M. Leichik [14], T.R. Kiyak [10], N.I. Kulish [12; 13], S.V. Grineva [4-7], and E.A. Sorokina [7; 15; 16], which focus on the effective structuring and construction of terms. Recommendations are also available for developing nomenclature [4; 5], organizing phrases, abbreviations, and the planned convergent development of related languages' vocabularies [20]. Regulation of terminology is not only possible but essential, as the advancement of scientific knowledge and human culture relies significantly on the state of terminology.

CONCLUSION. In conclusion, this research underscores the critical role of specialized vocabulary regulation within the broader context of language planning and policy. The analysis highlights that, unlike common vocabulary, specialized terminology is highly amenable to deliberate management and systematic development. The study reveals that effective language policy must incorporate a comprehensive understanding of terminological trends and practices, supported by both qualitative and quantitative data. Through the examination of current terminological challenges and strategies, it becomes clear that harmonizing and regulating specialized vocabularies can significantly enhance scientific progress, improve communication across disciplines, and facilitate international collaboration. The findings advocate for a proactive approach in language planning, emphasizing the need for robust frameworks and continuous adaptation to the evolving landscape of specialized knowledge. By addressing the complexities of terminological development, policymakers and linguists can foster more efficient and coherent communication in both national and global contexts.

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Rezyume: Maqolada terminologiyaning hozirgi holati va uning zamonaviy tilshunoslikning boshqa tegishli sohalari bilan aloqalari ko'rib chiqiladi. Tahlil shuni ko'rsatadiki, terminologiya til siyosati va tilni rejalashtirishga ta'sir qiladi. Kundalik lug'atdan farqli o'laroq, maxsus kasbiy terminologiya ataylab va ongli ravishda ishlab chiqilganligi ta'kidlangan. Til jarayonlarini sohaga oid terminologiyalar doirasida tartibga solish orqali tilning rivojlanishiga va uning funksional imkoniyatlariga atayin ta'sir o'tkazish mumkinligi ko'rsatilgan.

Резюме: В статье рассматривается современное состояние терминологии и ее связи с другими соответствующими областями современной лингвистики. Анализ показывает, что терминология влияет на языковую политику и языковое планирование. Подчеркивается, что в отличие от повседневной лексики специализированная профессиональная терминология разрабатывается намеренно и сознательно. Демонстрируется, что, регулируя языковые процессы в рамках отраслевых терминологий, можно намеренно влиять на эволюцию языка и его функциональные возможности.

Kalit so'zlar: madaniyatlararo kasbiy muloqot, atama, til, maxsus lug'at, terminologiyani xalqarolashtirish va uyg'unlashtirish, siyosat, terminologiya.

Ключевые слова: Межкультурная профессиональная коммуникация, термин, язык, специальная лексика, интернационализация и гармонизация терминологий, политика, терминология.

**ISSUES OF COMPARATIVE ANALYSIS OF NATIONAL AND FOREIGN LAW STANDARDS
REGARDING THE PROVISION OF MOBILE COMMUNICATION SERVICES**

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Summary: *In this article, the essence and specific features of the legislation of foreign countries in the legal regulation of mobile communication services are thoroughly analyzed. This article also contains suggestions and recommendations aimed at improving the legislation regulating this type of service in the Republic of Uzbekistan.*

Key words: *mobile communication, service, service delivery, legislation of foreign countries, telecommunications..*

Legal regulation of relations in the field of mobile communication services is based on current legislation and contractual provisions. We also believe that it is necessary to analyze the current state of scientific views on defining the concept of mobile communication service and giving legal definitions of the term "mobile communication service" of other countries. Based on this, the definition of mobile communication service can be formed.

It should be noted that the legal basis of mobile communication in Uzbekistan is also expressed to a certain extent in the new version of the Constitution, which came into force on May 1, 2023. In particular, as understood from the third-fourth parts of Article 33 of the Constitution, the rules regarding the creation of conditions for the use of the Internet by the state, the right of a person to process, receive and distribute information and its limits are defined. These rules, in turn, provide for the recognition of communication services at the legislative level and its recognition by the state. After all, the ultimate goal of providing or using mobile communication services is to receive and distribute information.

The rules for mobile communication services are provided for in the legislative documents on the regulation of information relations, as well as in the law and related regulations on telecommunications. This, in turn, means that the legal norms regulating mobile communication services are scattered in various legal documents.

For example, the laws on the principles of freedom of information and on the provision of information define the content of the right to receive information and guarantees in relation to it, while the telecommunication regulations directly define the concept, types, content and procedure of providing mobile communication, and in this regard specific issues are provided.

Nevertheless, communication entities and objects, owners of communication networks are expressed in the law on communication. More precisely, the expression of the rules related to communication services, in particular, mobile communication services, in different angles and purposes in different legislative documents, in turn, creates internal contradictions and difficulties in their application.

If we pay attention to the legislation of foreign countries in this regard, we can see that the regulation of mobile communication services at the legislative level is expressed in different ways.

Specifically, according to Article 1(1) of the French Telecommunications Act of 1996, a telecommunications service means the transmission or routing of signals or a combination of these actions using a telecommunications process [1]. That is, this legal definition of telecommunication service focuses on the technology of its provision and does not reveal the essence of telecommunication service, which is important for understanding it as an object of civil rights.

The UK Telecommunications Act 1984 takes a broad approach to the definition of a telecommunications service, providing a list of services rather than a definition. These include, among others, information and reference services, equipment installation and maintenance services [2].

It is appropriate to draw attention to the definition of telecommunications service in the German Telecommunications Act of July 25, 1996. In accordance with Clause 18 of Paragraph 3 of this Law, telecommunications services are professional offers for telecommunications, including offers for transmission to a third party; Also, according to paragraph 19 of the same paragraph, telecommunications services for the community are a professional offer for telecommunications on transmission lines for various individuals and legal entities, and not only subscribers of closed user groups [3].

Taking into account the definition of telecommunications, an offer of telecommunications, in other words, can be defined as an offer to send, transmit, receive any messages in the form of signs, language, images or sounds using telecommunication equipment.

Comparing the definition of the concept of mobile communication services contained in the Law "On Telecommunications" with the above, A.A. Bogutsky believes that it is more correct and clear, because it logically includes the action that constitutes the content of these services, i.e. shows the concept of mobile communication.

However, the author notes that it is very contradictory to show that the subject of a mobile communication service is a specific offer. The offer itself, in this case, is unlikely to be considered a service, because it cannot be assumed that only the person who wants to use the mobile communication service must pay for the offer [4., 111].

It should also be noted that the definition of a mobile communication service in Swedish law takes into account the information nature of a mobile communication service (according to Article 1 of the Swedish Telecommunications Act of July 1, 2007, a mobile communication service includes sound, text, images, data or special refers to the sending of data using radio transmission, network routing, or other electromagnetic technologies using designated transmission devices) [5].

Article 2, Clause 30 of the Law of the Republic of Lithuania No. VIII-774 of June 9, 1998 "On Telecommunications" provides that mobile communication services include signal transmission, switching, as well as transmission of messages by radio and cellular communication using telecommunication networks. or defined as partially dependent activities [6].

Mobile communication services in Estonia are regulated by the Estonian Telecommunications Act of February 9, 2000. The definition of mobile communication services is provided in paragraph 2 of this law. Mobile communication services, according to this law, are the transmission and routing of signals in a telecommunications network (or networks) and the establishment of connections between terminal points of a telecommunications network or telecommunications networks. Broadcasting does not belong to telecommunications, as well as mobile communication services [7].

The procedure for providing telecommunication services in the Russian Federation is regulated by the Federal Law No. 2003-FZ "On Communications" of July 7, 2003, in which they are called telecommunications or mobile communication services [8., 2895]. According to Article 2 of this law, mobile communication service is reception, processing, storage, transmission, delivery of telecommunication messages or mail. On the other hand, telecommunication refers to the transmission or reception of any radiation, signs, signals, voice data, written text, images, sounds or any messages through the radio system, wire, optical and other electromagnetic systems.

The telecommunications legislation of the United States of America defines the essence of the definition of mobile communication service. According to Section 48 of Section 3 of the US Telecommunications Act of 1996, a mobile communication is the transmission of information between user-defined points without changing the form or content of the data sent and received [9].

The General Agreement on Trade in Services of the World Trade Organization of April 15, 1994 (Telecommunications Annex) defines a "public telecommunications service" as any mobile communications service that requires a participant to make it publicly or actually available to a large number of persons. Such services may include, inter alia, telegraph, telephone, telex, and data transmission, which generally involves two or more transmissions between the initial and final points of transmission without any change in the form or content of the data. includes real-time information transmission to consumers between points [10., 482].

The legal regulation of mobile communication services in South Korea is based on a number of laws and regulations. In South Korea, the following legal documents are in force and state bodies are operating on the regulation of mobile communication services:

1. Telecommunications Business Act: this law regulates telecommunications activities, including mobile communications. It establishes rules and requirements for mobile operators and protects the interests of consumers.

2. Korea Communications Commission (KCC): The KCC is the regulatory body responsible for overseeing and regulating the communications industry in South Korea. It sets standards and norms for mobile operators, issues licenses and supervises their activities.

3. Consumer Protection Act (Consumer Protection Act): this law protects the rights of consumers in the field of mobile communications, including regulations on tariffs, quality of service and obligations of operators.

4. Privacy and Information Security Act (Personal Information Protection Act): the law regulates the collection, storage and processing of personal data of customers of mobile operators.

5. Quality of Service Standards Act (Quality of Service Standards Act): this law establishes quality standards for cellular services and requires operators to adhere to certain performance and quality parameters.

South Korea has a number of major mobile operators, SK Telecom, KT Corporation and LG Uplus, which provide a wide range of mobile services, including mobile phones, smartphones, internet access and other related services.

The provision of mobile communication services in Ukraine is regulated by the Law on Telecommunications and related regulations. Also, these services are determined by the norms of the Civil Code of Ukraine regarding service contracts.

It should be noted that Chapter 63 of the FC of Ukraine - "Services. "General rules". It provides that services can be provided free of charge. In addition, Chapter 63 of the FC of Ukraine - "Services. The chapter entitled "General rules" is defined as applicable to all types of services. In our opinion, it would be appropriate to include such rules in the FC of Uzbekistan.

It can be seen that the above concepts of mobile communication services are not very different, the difference is only in the volume or number of processes that are considered mobile communication. Therefore, due to the large number of functions that can be performed with the help of telecommunications, as well as the constant development of information technologies and the emergence of new types of communication, it is impossible to form a complete list of types of telecommunications.

As for scientific views on defining the concept of mobile communication services, it can be noted that there are different views in civil law that make it difficult to understand mobile communication services.

Thus, O.A. Bogutsky believes that mobile communication services are actions of the operator, as a result of which a person accesses a telecommunications network in order to receive, process, store, transmit certain signals, signs, images, sounds, etc. provided by [11., 5].

In our opinion, it is impossible to agree with the opinion of O.A. Bogutsky, because the mobile communication service cannot consist only of access to the telecommunication network. First of all, the effect of the service is the use of network functions: forwarding and receiving data, and so on.

General definitions of mobile communication or telecommunication services in general were also formulated by S.Yu. J. S.Yu. Prishpa mobile communication service is an operator's provision of services for a fee aimed at receiving, processing, transmitting, delivering signs, signals, written texts, images, sounds using telecommunication networks implemented by the telecommunications operator in accordance with the terms of the contract is a set of directed actions [13., 10].

It can be seen that these definitions do not pay enough attention to the information nature of mobile communication services, the address specifics of the data, and the need to satisfy the needs of the users of these services is not reflected.

Other definitions given in scientific works refer to individual mobile communication services.

In particular, T.M. Skorikova, for example, provides continuous telephone communication between subscribers of the cellular network of a certain operator, as well as between subscribers of the publicly used telecommunications network of other operators. defines it as an activity aimed at receiving, processing and transmitting voice and other information through the system of telecommunication networks using radio waves of a certain radio frequency spectrum to provide [14., 134].

I.I. Kozlov gives the following definition of wired telephone service: the activity of a communication operator that provides the ability to transmit voice data, fax messages and other data through the telephone network by establishing a mobile connection between the last equipment of the receivers [15., 9].

As can be seen from the above, all these scholars define mobile communication service as specific actions or activities, the difference is only in the volume of these actions.

There is also a definition of mobile communication service as a product of telecommunication organizations' activities, expressed in the final useful results of production activities for data transmission with a certain consumer value [16., 118].

In our opinion, actions that end with a certain result, and not the final result, should be recognized as services.

It should be noted that there are many definitions of telecommunication and mobile service as its component in special literature. For example, before the adoption of the Law on Telecommunications, a telecommunications service was considered as a product (result) of the activities of a telecommunications operator, consisting of the transmission or reception of selected data between points specified by the user. consists of, without changing the content of this data, radio communication and/or mobile (mobile) radio

communication using specified data, as well as on the basis of a contract for the use of lines, channels, roads from the telecommunications network resource by a telecommunications operator is to present [17., 153].

This definition is similar to that contained in the US Telecommunications Act of 1996 (Telecommunications Act of 1996), where a telecommunication is defined as a user's choice, without changing the form or content of the data sent and received. means information transfer [18].

In a certain way, these definitions were adopted by the legislator. The Law "On Communications", which has been adopted for more than 30 years and does not meet the technical capabilities of today's telecommunications and the volume and scope of relations arising in connection with it, is a product (result) of the activity of a communication operator aimed at meeting the needs of consumers of communication services. forms as

On the contrary, the current law "On Telecommunications" defines the telecommunication service as a product of the activity of the operator and/or telecommunications provider aimed at meeting the needs of consumers in the field of telecommunications. It is clear from this definition that the legislator defined the scope of these services and included in the definition another additional subject of relations in this field.

In our opinion, the legal definition of a mobile communication service, despite the changes, is somewhat vague and abstract, and it does not include the main important features of the telecommunication service arising from its socio-economic nature. It seems questionable to define a telecommunications service by describing a technology that is inherently changing.

In addition, the legislative definition does not clearly indicate what are the specific needs of consumers and what is the "product of activity" of the operator (provider). The list of obligations of the operator (provider) given in Article 22 of the Law "On Telecommunications" is very large in size, but, unfortunately, which of these obligations of operators (providers) is directly does not directly and clearly answer questions that may apply to telecommunications services.

Therefore, in our opinion, the definition of the telecommunications service established by the legislation requires certain precision.

Summarizing the research of scientific views on the definition of telecommunication services, the following conclusions should be drawn: in general, research does not pay enough attention to the formation of a general understanding of mobile communication and telecommunication services in general, the authors do not always criticize its legal definition; these definitions do not reflect all the important features of the mobile communication service. There is also a tradition of defining a mobile communication service only by its behavioral characteristics and not taking into account the need it satisfies.

Based on the characteristics of the mobile communication service and taking into account its specific aspects, we can offer the following doctrinal definition of this type of service, which reflects the general features of it. Mobile communication service is the transmission of information by the operator, telecommunications provider through the consumer's telecommunication networks, without changing its content and ensuring the confidentiality of communication, unless otherwise stipulated by law and/or unless it arises from the content of the relationship. action (activity) to satisfy the need for reception.

The proposed definition differs from the existing definitions because it contains such features as the information nature of the object of influence of the mobile communication service, the network nature of the service, and the actions of the service entities.

It should be noted that today mobile communication services have changed from the usual wireless phone conversations, sending voice messages or pictures, to communication over the Internet, as when this concept first appeared.

Mobile communication services are now the services of mobile communication operators and providers to perform mental operations through Internet conversations, messages (verbal, written, video and similar) or artificial intelligence-based programs. covering the package. In itself, this situation requires understanding of mobile communication services in harmony with Internet services. In this regard, if we refer to the works of foreign researchers, it will be possible to draw attention to a number of important developments in this regard.

In particular, the first works related to this issue: D. Barlow (Barlow J.) [19] "Declaration of the independence of the cyber environment", D. Post (Post D.), Patricia Bellia (Bellia P.) and Paul Berman (Berman P.) [20., 704] the study of conducting the main servers in the "test" mode, D. Reidenberg (Reidenberg J.) [21] Conflicts arising in determining Internet jurisdiction in solving technical issues of Internet operation the research on it can be cited the works of M. Froomkin (M. Froomkin), D. Zittrain (J. Zittrain) on the problems of cyber security regulatory mechanisms.

Of course, these works expressed important ideas about the use of the Internet in the field of mobile communication services and the expansion of the scope of mobile communication. At the same time, it should be noted that certain approaches to mobile communication services have been formed.

The rules of the World Trade Organization (WTO) adopted in 2000 [22] are based on the general legal principles of interaction between operators for the organization of traffic connection and transmission. By analyzing them, it is possible to determine the following principles of ensuring competition in the field of development of mobile communication services: non-discriminatory access; openness of connection to traffic and organization of its transfer; standard conditions for connecting and transferring traffic for operators; universal access to communication services.

At the same time, the principles and conditions of connection to the network should be published at the legal level, the standard conditions of traffic connection and transfer of operators and have significant differences for different operators. In this case, the following can be indicated as important conditions of the traffic connection and transmission contract [23]:

List of traffic connection and transfer, connection point and their technical means, network change and technical equipment; traffic, rerouting, billing and related fees, obligations and liability, quality of service provided; opportunities and obligations equivalent to number portability within the framework of number porting (MNP); other general provisions of national legislation applicable to contracts; that the price of traffic connection and transfer services should be based on the cost according to the rule.

It is necessary to pay attention to the fact that two different methods are used in the practice of foreign countries regarding the obligation of the subscriber to pay for the provision of mobile communication services.

These are: Bill&Keep and Calling Party Pays. Bill&Keep or "reciprocal provision of services" (the rate for the traffic transfer service is equal to "0"). Another way of this payment system is to apply compensation for traffic imbalance (if any) within the terms of the contract. In the Bill&Keep payment system, there is no requirement to regulate tariffs for traffic transfer services for operators at the legal level, and there will be no requirements for the organization of a separate accounting system of costs by types of services by a large communication operator.

In the Calling Party Pays payment system, the outgoing party pays (in which the tariff for traffic transfer services is not considered equal to "0"). In this case, calculations are made for operators for traffic transfer services (in practice, payments are based on revenue received from subscribers between operators).

In BST instructions, the main criterion for choosing one of the above two systems of subscriber fees is the presence or absence of a significant imbalance in traffic [24., 8].

In a number of countries where Calling Party Pays is used, state regulation of tariffs for traffic transfer services based on the system of separate calculation of costs by types of services to determine certain economically based costs for the main communication operators has been established.

Today, the Calling Party Pays system applies in Uzbekistan, and the outgoing party makes payments for traffic. In this case, the maximum amounts of subscriber fees, the price of traffic transfer are regulated by the state in a certain sense (Clause 325 of the "Telecommunication Services Provision Rules").

Such an approach is appropriate based on the level of economic and social development of Uzbekistan and the country's socially oriented economic policy.

It is noticeable that the "Take or Pay" model used in foreign countries applies to the contract for the provision of mobile communication services. The "Take or Pay" model means that in contractual relations, the consumer, subscriber, business partner, or simply the other party to the contract must make the payment, regardless of whether or not he receives the goods, work, or service. For example, in mobile communication services, the subscriber makes a monthly subscription fee and pays the fee in full even if he does not use all the services offered to him, or at the end of the month, the difference between the payment made and the price of the services used No deductions or refunds apply.

This system is used as a system to support business representatives or protect their activities from dishonest consumers. In other words, regardless of how much of the volume of services the consumer uses after making a monthly subscription payment for the mobile communication service, he will not be charged for only the part he used, but the full amount will be deducted for the agreed service package. .

A number of opinions have been expressed in the legal literature regarding this model of service provision. For example, according to Carl R. Schultz [25], within the framework of "take or pay", the buyer (customer of services) orders the required amount of goods (services) for himself, and regardless of whether he receives it in full or in part nazar makes the agreed payment, if the quantity of the ordered goods is not enough for the needs of the buyer, he can receive the next set of goods for an additional fee.

According to experts [26], this contract should be defined as a framework contract and the minimum volume of services provided to all subscribers should be defined.

In our opinion, the validity of the "take or pay" contract structure model in the law of Uzbekistan today is understood from Article 705 and Article 707 of the FC. Of course, in service relations, "take or pay" means that the customer has the right to unilaterally cancel the contract, but this right can be exercised only by full payment of the fee stipulated in the contract.

At the moment, the validity of the "take or pay" model in relation to mobile communication services is understood from Section V of the Rules. After all, paragraph 332 of this section defines the methods and procedure for making payments. In general, the "take or pay" model fully corresponds to the content and essence of mobile communication services, and in order to fully implement this model in the regulation of these relations in Uzbekistan, the contract for the provision of mobile communication services concluded by the subscriber is only fee-only. It is required to express the rules that can be canceled by payment in a special legislation.

In recent years, many scientific opinions [27., 21] have been put forward regarding the application of the doctrine of "code is law" in relation to the use of smart technologies in mobile communication, including communication via the Internet. At the heart of this new doctrine applied to service contracts is regulatory influence through "code numbers."

After all, "in the conditions in which the current legal constructions in the field of service are unable to fulfill their regulatory function in a number of cases" [28] "digital codes" provide opportunities to define a certain protection, protection and contractual procedure. Secret digital codes, in turn, ensure that both the subscriber and the service provider fulfill their mutual contractual obligations, and the disclosure of these secret codes creates a certain responsibility for both parties.

According to A.A. Kritsula [29., 239], "digital codes" are at the core of smart contracts, and through them, provision of mobile application services, provision of communication through mobile devices can be carried out without concluding a contract. In this respect, it is possible to purchase Internet traffic, order certain services and receive them through mobile devices. For this reason, it is necessary to include provisions on the formation of the doctrine of "code is law" in the national legislation, to determine the provisions corresponding to this doctrine in the field of mobile communication services, and for this, it is necessary to establish the norms related to smart contracts at the legislative level [30., 34].

The provision of mobile communication services has already become the most widespread and widely used field of digitization. This, in turn, creates the problem of "digital footprint" in this type of service.

Experts [31] divide this concept into two types: "active digital footprint" and "inactive digital footprint". "Active digital footprint" is the information entered by the subscribers to receive the service in the digital environment, while "inactive digital footprint" is the data about the person that the subscribers leave without noticing it due to carelessness.

This will ultimately solve the problem of protecting subscribers' personal data, and their use will make the issue of creating technology the order of the day.

However, before using each mobile communication service, a subscriber or user is required to register, and this subsequently creates certain issues regarding the storage, processing and protection of personal data. In particular, it is necessary to define approaches based on the concept of "digital footprint" in the objects of social network accounts, sites and channels, or similar objects of other mobile communication services.

In our opinion, the concept of "digital trace" in this matter, along with the determination of obligations at a certain legal level towards the mobile communication operator or provider, strengthens specific measures of responsibility for the protection of personal data in the contracts concluded with the subscriber, or deletes this trace from the operator's or provider's server. requires the provision of strict guarantees.

It should be noted that the requirements for the personal data of the subscribers of the Republic of Uzbekistan to be stored on the servers located in this country are appropriate and that this comes from the "digital footprint" concept.

In particular, Article 271 of the Law "On Personal Data" [32] of July 2, 2019 establishes special conditions for processing personal data of citizens of the Republic of Uzbekistan, according to which "the owner and (or) the operator must process personal data of citizens of the Republic of Uzbekistan on technical means physically located in the Republic of Uzbekistan."

Appendix to the order of the Minister of Justice of the Republic of Uzbekistan No. 19 of November 14, 2023 "The structural division of the owner and (or) operator of the personal database that ensures the processing of personal data and their protection or the model procedure for organizing the activity of an authorized person" [33] defines the duties and obligations of persons processing personal data.

Digitization of mobile communication and its inextricable connection with the Internet and the fact that it cannot exist without the Internet created a "conceptual explosion" in itself.

Today, as a result of the Internet, mobile communication, digitization, many common concepts and terms have entered the service sector, most of which are related to the different expressions of words in foreign languages.

At the same time, it is important to unify the application of these concepts, to determine the contractual constructions applied to them, and to form the content of these services.

Therefore, the application of legal norms applicable to the services of "electronic communication services", "Internet services", "roaming services", "cloud computing (English - cloud computing)" and other similar terms used in the field of mobile communication services. it will be necessary to unify the rules.

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Rezyume: Ushbu maqolada mobil aloqa xizmatlarini huquqiy tartibga solishda xorijiy davlatlar qonunchiligining mazmun-mohiyati va o'ziga xos xususiyatlari atroflicha tahlil qilingan. Mazkur maqolada shuningdek O'zbekiston Respublikasida ushbu xizmat turini tartibga soluvchi qonunchilikni takomillashtirishga qaratilgan taklif va tavsiyalar ishlab chiqilgan.

Резюме: В данной статье подробно анализируются сущность и особенности законодательства зарубежных стран в правовом регулировании услуг мобильной связи. В данной статье также содержатся предложения и рекомендации, направленные на совершенствование законодательства, регулирующего данный вид услуг в Республике Узбекистан.

Kalit so'zlar: mobil aloqa, xizmat, xizmat ko'rsatish, xorijiy davlatlar qonunchiligi, telekommunikatsiya.

Ключевые слова: мобильная связь, услуга, оказание услуг, законодательство зарубежных стран, телекоммуникации.

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APPLICATION OF SPECIAL CLAUSES IN FOREIGN ECONOMIC TRANSACTIONS

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Summary: *This article discloses special clauses applied in foreign economic transactions, such as applicable law, arbitration clause, force majeure clause, safeguard clause.*

Keywords: *clauses, foreign economic transactions, applicable law, arbitration clause, force majeure, safeguard clause.*

One of the important meanings when concluding foreign economic transactions is the use of special clauses in contracts, which can be classified as mandatory or optional (additional) conditions of foreign economic transactions. Despite the fact that special clauses are not mandatory conditions of foreign economic transactions, they are very important for their successful conclusion of transactions and resolution of disputes between the parties.

In international contractual practice, special clauses in foreign economic transactions include: a clause on the applicable law, a clause on the procedure for resolving disputes, a force majeure clause and a protective clause.

Among special clauses in the conclusion of foreign economic transactions one of the most widespread is the **applicable law clause**, as one of the parties to the transaction is a representative of another state. Most often when choosing the applicable law the parties to foreign economic transactions resort to the use of the principle of autonomy of will of the parties. But in cases of impossibility to agree on the applicable law in foreign economic transactions, it is required to determine it when a dispute arises on the basis of conflict of laws. Therefore, the parties need to choose the applicable law and reflect it in the foreign economic transaction.

The relationship of the parties is determined not only by the terms of the contract, but also by the rules of applicable law [8]. According to the national legislation of different countries, the parties are absolutely free to choose the applicable law to the contract. Regardless of whether the legal system chosen for application is related to this contract, the choice made by the parties is binding when resolving disputes for court and arbitration. When choosing the applicable law, the parties have the right to choose the law to be applied, both for the contract as a whole and for its individual parts.

Obviously, the applicable law clause allows the parties to a foreign trade transaction to determine the legal system that will apply to the contract in the event of a dispute. For example, when concluding a foreign economic transaction between a company from Uzbekistan and a foreign partner, it may be indicated that English law or the law of the Republic of Uzbekistan or the law of another country is applicable, one of them is chosen as the parties consider it more appropriate for their transaction.

This clause is most often found in the texts of foreign economic transactions and textually can look like the following variants:

"All issues not settled by this contract shall be resolved in accordance with the legislation of the Republic of Uzbekistan".

"The law of the Republic of Uzbekistan shall apply to this contract".

"All issues not settled by this contract shall be governed by: as to the Seller's obligations – the law of the Seller's country (the Russian Federation); as to the Buyer's obligations – the law of the Buyer's country (the Republic of Uzbekistan)".

The following clause helps the parties in case of disputes in foreign economic transactions to determine the jurisdiction of disputes, which is called a **dispute resolution clause**. The absence of this clause in a foreign economic transaction means that disputes between the parties will be resolved in accordance with the norms of national legislation or international legal treaties on the delimitation of the jurisdiction of the courts. A lot of problems arise between the parties in the absence of this clause, as each party wants the dispute to be resolved on the territory of their state.

Sometimes in a dispute resolution clause, the parties can provide for pre-trial consideration of disputes through peaceful settlement, and in case of disagreement, the transition to the judicial order of consideration of the dispute. Before the judicial procedure of dispute settlement, the parties may provide for by negotiation or mediation.

It should be noted that a special clause or dispute resolution clause is also called an **arbitration clause**, which provides for the resolution of disputes not on the application of procedural law of state courts, but are considered by the international commercial arbitration court.

There are 2 types of arbitration: permanent (institutional) arbitration and special or so-called ad hoc arbitration. A permanent arbitration institution is established, as a rule, at the Chamber of Commerce and Industry of the respective state and specializes in resolving disputes on foreign economic transactions. As for the arbitration ad hoc, it is created to resolve disputes under a contract on the terms and conditions stipulated by the agreement of the parties, i.e. special and to resolve disputes only under this contract. The parties' choice of such a procedure implies that they should be as responsible as possible in formulating the arbitration agreement. A vague formulation in the contract of the rules for the organization and operation of ad hoc arbitration may lead to significant difficulties in resolving the dispute, especially considering that the mere presence of an arbitration clause in the contract, as already emphasized, completely excludes state proceedings and the application of procedural legislation.

Under an arbitration clause or arbitration agreement, the parties agree to submit all or certain disputes to arbitration. They have the opportunity not only to determine the competent arbitration body, but also to establish the procedure for arbitration proceedings if ad hoc arbitration is chosen, or to refer to the Rules if a permanent (institutional) arbitration body is chosen. The agreement may also determine the composition of the arbitral tribunal (number of arbitrators), the place of arbitration, the language of arbitration, and the applicable law of the country for dispute resolution [2].

When choosing a permanent or institutional international commercial arbitral tribunal, the parties should correctly and fully refer to the name of the tribunal. In case of incorrect reference, this may lead to the arbitration clause being recognized as invalid later [9].

According to the legislation of the Republic of Uzbekistan when considering disputes in the International Commercial Arbitration with respect to arbitrators, the following is provided [1]:

- *number of arbitrators* – the parties have discretion to determine the number of arbitrators and, in the absence of such determination, three arbitrators shall be appointed;
- *determination of the rules of procedure* – the parties may, at their discretion, agree on the procedure for conducting the proceedings by the arbitral tribunal. In the absence of such an agreement, the arbitral tribunal may conduct the arbitration proceedings in the manner it considers appropriate. The powers granted to the arbitral tribunal include the power to determine the admissibility, relevance, materiality and significance of any evidence;

– *place of arbitration* – the parties may, at their discretion, agree on the place of arbitration. In the absence of such an agreement, the place of arbitration is determined by the arbitral tribunal, taking into account the circumstances of the case, including the factor of convenience for the parties. Unless the parties agree otherwise, the arbitral tribunal may meet at any place it considers appropriate to conduct consultations among its members, hear witnesses, experts or parties, or inspect goods, other property or documents;

– *language of arbitration proceedings* – the parties may, at their discretion, agree on the language or languages to be used in the arbitration proceedings. In the absence of such an agreement, the arbitral tribunal shall determine the language or languages to be used in the proceedings. Such agreement or determination, unless otherwise specified, applies to any written statement by a party, any hearing and any award, order or other communication of the arbitral tribunal. The arbitral tribunal may order that any documentary evidence be accompanied by a translation into the language or languages agreed upon by the parties or determined by the arbitral tribunal;

– *rules applicable to the substance of the dispute* – the arbitration court resolves the dispute in accordance with such rules of law that the parties have chosen as applicable to the substance of the dispute. Unless otherwise indicated, any reference to the law or system of law of a State shall be construed as referring directly to the substantive law of that State and not to its conflict of laws rules. In the absence of any indication by the parties, the arbitral tribunal will apply the law determined in accordance with the conflict of laws rules that it considers applicable. The arbitral tribunal makes a decision in equity or as a “friendly mediator” only if the parties expressly authorize it to do so. In all cases, the arbitral tribunal makes a decision in accordance with the terms of the contract and taking into account trade customs applicable to the transaction.

In foreign economic transactions, depending on the procedure chosen by the parties, dispute resolution clauses may have different wording.

For example:

"All disputes under this contract shall be considered by the Tashkent Interdistrict Economic Court".

"All disputes arising out of or in connection with this contract shall be settled by the parties through negotiations. If the parties are unable to resolve disputes by negotiation, they shall be considered by the International Commercial Arbitration (Arbitration) Court at the Chamber of Commerce and Industry of the Republic of Uzbekistan".

"All disputes under the contract shall be resolved by a three-person arbitration tribunal specially created for this purpose. One arbitrator shall be appointed by the claimant, the second by the respondent, and the third shall be appointed by the arbitrators of the parties by mutual agreement. The seat of the arbitral tribunal shall be the city of Tashkent, Republic of Uzbekistan.

Dispute resolution shall be conducted in accordance with the UNCITRAL Arbitration Rules."

"Disputes under this contract concerning quality, set, assortment of goods and drafting of documents shall be settled in the London Court of International Arbitration (LCIA). Other disputes are resolved in the International Commercial Arbitration (Arbitration) Court at the Chamber of Commerce and Industry of the Republic of Uzbekistan".

Obviously, in foreign economic transactions, the parties can form the arbitration clause in different ways, but there are also model arbitration clauses, which are designed by arbitration institutions themselves, are sufficient to ensure smooth and flexible arbitration in the event of a dispute [9].

For example, the arbitration clause of Hong Kong International Arbitration Centre (HKIAC):

"Any dispute, controversy, difference or claim arising out of or relating to this contract, including the existence, validity, interpretation, performance, breach or termination thereof or any dispute regarding non-contractual obligations arising out of or relating to it shall be referred to and finally resolved by arbitration administered by the Hong Kong International Arbitration Center (HKIAC) under the HKIAC Administered Arbitration Rules in force when the Notice of Arbitration is submitted. The law of this arbitration clause shall be [law]. The seat of arbitration shall be [City]. The number of arbitrators shall be [one/three]. The arbitration proceedings shall be conducted in [language]" [12].

Arbitration clause of the Arbitration Institute of the Stockholm Chamber of Commerce (SCC):

"Any dispute, controversy or claim arising out of or in connection with this contract, or the breach, termination or invalidity thereof, shall be finally settled by arbitration in accordance with the Arbitration Rules of the Arbitration Institute of the Stockholm Chamber of Commerce" [12].

In resolving international commercial disputes, arbitration, unlike a court, does not always consider them based only on the rules of the applicable substantive law of a country. Recently, quite often the parties to foreign economic transactions agree to apply the so-called *lex mercatoria* (law of international trade) to their relations under the transaction, as well as principles common to two or more legal systems, or agree to resolve the case in equity. In addition, sometimes international commercial arbitration tribunals make decisions in accordance with the terms of the contract and taking into account the trade customs applicable to a given foreign economic transaction. It is necessary to properly form an arbitration clause in foreign economic transactions, which subsequently plays an important role in the formation of the dispute resolution [9].

Based on the above, it should be noted that the dispute resolution clause establishes a dispute resolution mechanism, including mediation, arbitration or court proceedings.

A force majeure clause is introduced in foreign economic transactions in order to provide for conditions under which the parties may be released from liability for non-fulfillment or improper fulfillment of obligations under the contract. The national legislation of most states provides for exemption from liability in cases where non-fulfillment or improper fulfillment of obligations was caused by force majeure. Therefore, a force majeure clause may also be referred to as force majeure circumstances.

In the UNIDROIT Principles, force majeure is an impediment beyond a party's control; in the ICC provisions, it is an impediment beyond its reasonable control that could not have been foreseen at the time of contracting and could not reasonably have been avoided or overcome [11].

Force majeure is a clause that is often included in contracts, which generally states that a party is relieved of any liability for breach of its obligations if such breach is due to an external event beyond that party's control.

In English law, there is no category of "force majeure", but a party may be released from liability in cases where performance is rendered impossible by frustration, which may result from physical or material impossibility of performance or legal impossibility of performance, or from a material change in circumstances which defeats the purpose of the contract and renders performance purposeless or substantially different from the purposes intended by the parties [3]. In US law, the doctrine of frustration is used in a narrower sense – only as frustration of the purpose of the contract, supplemented by the concept of "impracticability of performance" ("impracticability of performance"). According to Article 2-615 UCC of the USA), the parties are released from the fulfillment of contractual obligations in cases of impracticability of performance, i.e. if any circumstances have occurred, the absence of which was the main prerequisite for the conclusion of the contract. In the doctrine and judicial practice of such countries as France, Germany, Switzerland, were developed signs of force majeure: first of all, its external (extraneous) nature,

unforeseeability, unavoidability, emergency [4]. In the legislation of the Republic of Uzbekistan, force majeure (force majeure circumstances) means extraordinary, unavoidable and unforeseeable under the given conditions circumstances caused by natural phenomena (earthquakes, landslides, hurricanes, droughts, etc.) or socio-economic circumstances (state of war, blockades, bans on imports and exports in the public interest, etc.), independent of the will and actions of the parties, in connection with which they cannot fulfill the assumed obligations [2].

Often the parties to foreign economic transactions include in their contracts a summary of the force majeure clause, for example: "The parties to the contract are exempt from liability due to force majeure". In this case, the parties assume the risk that the applicable law will fully define the characteristics of the relevant circumstances. However, such an approach cannot be considered sufficiently reasonable. First of all, because there are differences in the understanding and interpretation of the concept of force majeure among national legal systems, and some legal systems do not contain any specific provisions on the subject at all [10].

It should be noted that the inclusion of a force majeure clause in foreign economic transactions is very advisable for the following reasons, namely:

- relations related to foreign economic activity involve a conflict of laws of several states. Therefore, discrepancies in the interpretation of the concept of force majeure according to the laws of the countries of counterparties are quite likely. In order to avoid surprises and disagreements on issues of force majeure, the parties are advised to carefully formulate in the text of the contract exactly what circumstances they recognize as force majeure and, therefore, exempt from liability under the contract. Subsequently, a force majeure clause in the contract will exclude the application of the relevant norms of civil law;

- by special agreement, the parties have the right to exempt themselves from liability under the contract not only on grounds of force majeure in the traditional sense (natural disasters, military actions, etc.), but also for other circumstances that are not natural, but are beyond the control of the executor of the obligation. The parties can not only release each other from liability in the event of force majeure, but also change the execution procedure in such cases, for example, extend the deadlines, reduce the price, etc. [7]

Care must be taken to ensure that the wording of the force majeure clause is not internally inconsistent. In practice, there were contracts that released a party from liability for failure to fulfill the contract by one clause, and by another clause of the contract extended the period of performance by three, six months or "until the termination of force majeure circumstances".

It is advisable to indicate in the text of the clause how the parties will confirm the existence of force majeure circumstances, i.e. list documents that can serve as evidence of the reality of these circumstances.

Based on this, a force majeure clause in a contract may look like this.

"The parties are released from liability for partial or complete failure to fulfill obligations under this agreement if it was the result of force majeure circumstances: fire, pandemic, natural disasters, state of war, military operations of any nature, blockades, prohibition of exports and imports, government actions and decisions or other circumstances beyond the control of the Parties that arose after the signing of this agreement.

If force majeure circumstances occur, the Party for which it is impossible to fulfill its obligations under this Agreement must, no later than 5 (five) days from the date of their occurrence, notify the other Party about them in writing, attaching the relevant evidence.

In the event of force majeure circumstances, the deadline for fulfilling the obligation under this agreement is postponed for the period during which such circumstances and their consequences apply.

If force majeure circumstances continue to apply for more than one month, the Parties have the right to terminate this Agreement unilaterally by notifying the other Party in writing".

COVID 19, namely the spread of coronavirus infection, has become one of the main impetuses for the parties to include a force majeure clause in their contracts.

Security clause is a special monetary and financial condition of a foreign economic transaction that includes an insurance system for the risk of currency losses, aimed at protecting the economic interests of the parties in the event of a change in the contract price in the event of a change in the exchange rate of the payment currency.

Obviously, a security clause provides an additional guarantee and protection of the interests of one of the parties to a foreign economic transaction. These clauses help to minimize risks associated with the fulfillment of obligations, changes in the legal and economic environment, and also provide a higher level of predictability and security for participants in a foreign economic transaction.

A currency clause (caution clause) is a condition included in an international economic contract in order to insure the exporter against the risk of a depreciation of the currency of payment between the time the transaction is concluded and the actual time of payment. A currency clause can be used when concluding import contracts and to ensure the interests of the importer when an increase in the exchange rate of the transaction currency is expected. In other words, when determining the terms of payment, in addition to the price and form of payment, the payment currency, conversion rate and currency clause to reduce or eliminate currency risk are established [5].

There are different types of protection clauses:

Adaptation Clause represents the opportunity to reconsider and change the terms of the contract in the event of circumstances arising that significantly change the original terms of the transaction. Often found, in the event of significant exchange rate fluctuations, the parties may renegotiate prices or payment terms in order to maintain the economic benefits of the transaction.

Hardship Clause – revision of the terms of the contract in the event of force majeure circumstances that significantly change the balance of benefits and costs of the parties. For example, if new export duties are introduced, the parties may reconsider prices or supply volumes.

The Termination Clause provides conditions and procedure for terminating the contract upon the occurrence of certain circumstances.

Suspension Clause – the right of one of the parties to suspend the fulfillment of its obligations if the other party fails to fulfill its obligations.

Protective clauses provide flexibility and adaptability of contract terms to maximize the protection of your interests.

In conclusion, it should be noted that in foreign economic transactions, special clauses are an important tool that ensures clarity, predictability and protection of the interests of the parties. Correct application of special clauses and their reflection in contracts will help the parties manage risks and prevent conflicts. Therefore, parties to foreign economic transactions should carefully consider and include such clauses in their contracts.

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Rezyume: Ushbu maqolada maxsus huquqni qo'llash, arbitraj sharti, fors-major holatlari, himoya sharti kabi tashqi iqtisodiy bitimlarda qo'llaniladigan maxsus shartlar ochib berilgan.

Резюме: В данной статье раскрываются специальные оговорки, применяемые во внешнеэкономических сделках, такие как применимое право, арбитражная оговорка, форс-мажор, защитная оговорка.

Kalit so'zlar: shartlar, tashqi iqtisodiy bitimlar, huquqni qo'llash, arbitraj sharti, fors-major holatlari, himoya sharti.

Ключевые слова: оговорки, внешнеэкономические сделки, применимое право, арбитражная оговорка, форс-мажор, защитная оговорка.