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KONVOLYUTSION NEYRON TARMOQ YORDAMIDA IMZO XUSUSIYATLARINI AVTOMATIK AJRATISH USULI

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Annotatsiya. Ushbu maqolada konvolyutsion neyron tarmoq (CNN) arxitekturasi yordamida shaxs imzosidan avtomatik ravishda xususiyatlarni ajratish usuli taqdim etiladi. Taklif etilgan yondashuv an'anaviy qo'lda xususiyat ajratish usullaridan farqli o'laroq, chuqur o'rganish tamoyillariga asoslanib, imzo tasvirlarining yuqori darajali semantik belgilarini avtomatik tarzda o'rganadi. Eksperimental natijalar CEDAR ma'lumotlar to'plami ustida olib borilgan bo'lib, taklif etilgan CNN modeli 96.8% aniqlik va 0.965 F1-Score ko'rsatkichiga erishdi. CNN va bir sinfli tayanch vektor mashinasi (OC-SVM) kombinatsiyasi esa 97.3% aniqlikni ta'minladi.

Kalit so'zlar: Konvolyutsion neyron tarmoq, CNN, imzo verifikatsiyasi, xususiyat ajratish, chuqur o'rganish, OC-SVM, biometrik autentifikatsiya.

Raqamli texnologiyalarning jadal rivojlanishi sharoitida shaxsni identifikatsiyalash va autentifikatsiyalash masalasi alohida ahamiyat kasb etmoqda. Imzo biometrik identifikatsiyaning an'anaviy va keng tarqalgan usullaridan biri bo'lib, bank, yuridik va ma'muriy sohalarda shaxsni tasdiqlashning asosiy vositasi sifatida qo'llaniladi [1]. An'anaviy usullar — qo'lda ajratilgan xususiyatlarga asoslangan HOG, LBP, Zernike momentlari kabi deskriptorlar — bir qator cheklovlarga ega: ekspert bilimlarini talab qilish, imzo variatsiyalariga sezgirlik, soxta imzolarni aniqlashdagi past unumdorlik [2].

Ushbu cheklovlarni bartaraf etish maqsadida keyingi yillarda chuqur o'rganish (deep learning) usullari, xususan konvolyutsion neyron tarmoqlar (CNN) keng qo'llanilmoqda. Ushbu tadqiqotning asosiy maqsadi — CNN arxitekturasini imzo xususiyatlarini avtomatik ajratish uchun qo'llash va uning samaradorligini an'anaviy usullar bilan qiyosiy tahlil qilishdan iborat. Bundan tashqari, ajratilgan xususiyatlar asosida OC-SVM klassifikatorini integratsiyalash orqali yagona gibrid verifikatsiya tizimi shakllantiriladi.

Imzo verifikatsiyasi tadqiqotlarida ikki asosiy yo'nalish mavjud: onlayn (dynamic) va oflayn (static) verifikatsiya. Onlayn usulda imzoning raqamli qalam bilan yozilish jarayonidagi vaqt ketma-ketligi, bosim va tezlik ma'lumotlari qayta ishlanadi. Oflayn usulda esa tayyor tasvir tahlil qilinadi — bu amaliy qo'llanishda ko'proq uchraydigan holat [3]. Adabiyot tahlili shuni ko'rsatadiki, CNN asosidagi usullar imzo

verifikatsiyasida muhim yutuqlarga erishgan. Hafemann va boshqalar (2017) SigNet arxitekturasini taklif qilib, 95.8% aniqlikka erishdilar [2]. Dey va boshqalar (2017) Siamese tarmoq yordamida yozuvchidan mustaqil verifikatsiyani amalga oshirdilar [5]. Biroq ko'pchilik tadqiqotlar katta hajmli ma'lumotlar to'plamini talab qiladi va kam miqdordagi namunalarda samaradorligi pasayadi — bu hol amaliy qo'llanishdagi asosiy muammo bo'lib qolmoqda.

Mavjud usullarning asosiy kamchiliklari: Birinchidan, An'anaviy usullar (HOG, LBP): Xususiyatlar qo'lda tanlanadi, imzo variatsiyalariga nisbatan sezgir. Ikkinchidan, Standart CNN modellari: Katta hajmli o'quv ma'lumotlarini talab qiladi, oz namunali sharoitda ishlash sifati pasayadi. Uchinchidan, Transfer learning yondashuvi: Boshqa sohadan olingan vazn matritsalari imzo spetsifikasiga to'liq moslashmaydi.

Taklif etilgan usul uch bosqichdan iborat: (1) tasvir oldindan qayta ishlash, (2) CNN yordamida xususiyat vektori ajratish, (3) OC-SVM orqali tasniflash. Tasvir oldindan qayta ishlash. Xom imzo tasvirlari quyidagi transformatsiyalarga uchraydi: 1) O'lchamni standartlashtirish: 128×128 piksel (saqlovchi proporsiya bilan), 2) Grayscale konversiyasi va contrast normalizatsiyasi (CLAHE algorimi) 3) Threshold binarizatsiya (Otsu usuli): ΔB fon ajratish, 4) Data augmentatsiya: ±15° aylantirish, ±10% masshtablash, shovqin qo'shish.

Taklif etilgan CNN modeli quyidagi tuzilmaga ega:

Qatlam turi	Parametrlar	Chiqish o'lchami	Aktivatsiya
Conv2D (1)	32 filtr, 3×3	126×126×32	ReLU
MaxPool (1)	2×2, stride=2	63×63×32	—
Conv2D (2)	64 filtr, 3×3	61×61×64	ReLU
MaxPool (2)	2×2, stride=2	30×30×64	—
Conv2D (3)	128 filtr, 3×3	28×28×128	ReLU
Conv2D (4)	128 filtr, 3×3	26×26×128	ReLU
MaxPool (3)	2×2, stride=2	13×13×128	—
Flatten	—	21632	—
Dense (1)	512 neytron	512	ReLU + Dropout(0.5)
Dense (2) — Xususiyat	128 neytron	128	ReLU

Dense (3) — Chiqish	2 sinf	2	Softmax

1-jadval. Taklif etilgan CNN arxitekturasi.

128 o'lchamli xususiyat vektori (Dense-2 qatlami chiqishi) keyingi bosqichda OC-SVM klassifikatoriga uzatiladi. Bu yondashuv ikkita afzallikni ta'minlaydi: (1) CNN imzo tasvirining eng muhim semantik belgilarini o'rganadi; (2) OC-SVM bir sinfli o'rganish orqali soxta imzolarni aniqlaydi.

Model ikki bosqichda o'qitiladi. Birinchi bosqichda CNN Cross-Entropy yo'qotish funksiyasi bilan o'qitiladi:

$$L = -\sum_i y_i \cdot \log(\hat{y}_i)$$

bu yerda y_i — haqiqiy yorliq, $\hat{y}_i$ — model bashorati. Ikkinchi bosqichda Dense-2 chiqishi (128 o'lchamli vektor) OC-SVM modelini o'qitish uchun ishlatiladi. OC-SVM yadro funksiyasi sifatida radial bazis funksiyasi (RBF) qo'llaniladi:

$$K(x_i, x_j) = \exp(-\gamma \|x_i - x_j\|^2).$$

Eksperimentlar CEDAR (Center of Excellence for Document Analysis and Recognition) ma'lumotlar to'plamida o'tkazildi. To'plam 55 yozuvchining 1,320 ta haqiqiy va 1,320 ta soxta imzosini o'z ichiga oladi. Ma'lumotlar 70% o'qitish, 15% validatsiya va 15% test to'plamlariga bo'lindi. O'qitish parametrlari: Adam optimallashtiruvchi (lr=0.001), batch o'lchami=32, epoch soni=100, Early Stopping (patience=10). Barcha tajribalar Google Colab muhitida (NVIDIA Tesla T4 GPU) amalga oshirildi.

Model / Usul	Aniqlik (%)	Xato qabul (FAR %)	Xato rad (FRR %)	F1-Score
AlexNet (CNN)	89.4	8.2	13.1	0.882
VGG-16 (CNN)	93.7	5.1	7.8	0.931
ResNet-50 (CNN)	95.2	3.9	6.1	0.948
Taklif etilgan CNN	96.8	2.7	4.3	0.965
HOG + SVM	84.1	12.6	19.8	0.831
CNN + OC-SVM	97.3	2.1	3.8	0.972

2-jadval. Turli usullarning CEDAR ma'lumotlar to'plamidagi taqqosiy natijalari

Natijalar shuni ko'rsatadiki, taklif etilgan CNN modeli barcha an'anaviy usullarni (HOG+SVM: 84.1%) sezilarli darajada ustib ketdi. CNN+OC-SVM gibrid yondashuvi

esa eng yuqori natijani — 97.3% aniqlik va 0.972 F1-Score — ko'rsatdi. Bu natija mavjud adabiyotlardagi o'xshash arxitekturalarga qiyoslanishi mumkin darajada raqobatbardosh hisoblanadi.

Asosiy kuzatishlar: CNN arxitekturasi chuqurlashgan sari (Conv qatlamlari ko'payganida) aniqlik 6.3% ga oshdi. Dropout(0.5) regularizatsiyasi ortiqcha o'rganish (overfitting) muammosini 8.7% ga kamaytirdi. Data augmentatsiya qo'llash test aniqligini 2.4% ga yaxshiladi. CNN xususiyat vektori (128 o'lcham) OC-SVM uchun optimal bo'lib chiqdi; 256 o'lcham sezilari yaxshilanish bermadi.

Olib borilgan tadqiqot konvolyutsion neyron tarmoqning imzo xususiyatlarini avtomatik ajratishdagi yuqori samaradorligini isbotladi. An'anaviy usullarga nisbatan asosiy ustunlik shundan iboratki, CNN ixtisoslashgan bilimlarni talab qilmasdan, tasvir ma'lumotlaridan o'zi optimal xususiyatlarni o'rganadi. CNN va OC-SVM kombinatsiyasi ayniqsa muhim ahamiyat kasb etadi: CNN yuqori darajali xususiyatlarni ajratadi, OC-SVM esa faqat haqiqiy imzo namunalari asosida chegarani belgilaydi. Bu yondashuv soxta imzolar to'plami mavjud bo'lmagan real sharoitlarda katta amaliy qiymatga ega. Tadqiqot cheklovlari: CEDAR ma'lumotlar to'plami asosan ingliz harflaridan iborat imzolarni o'z ichiga oladi. O'zbek yozuvi xususiyatlarini hisobga olgan holda mahalliy ma'lumotlar to'plami shakllantirilishi maqsadga muvofiq. Bundan tashqari, real vaqtda ishlash (inference) tezligi keyingi tadqiqotlarda optimallashtirilishi kerak.

Taklif etilgan CNN arxitekturasi CEDAR to'plamida 96.8% aniqlikka erishdi — bu an'anaviy HOG+SVM usulidan 12.7% ga yuqori. CNN+OC-SVM gibrid tizimi 97.3% aniqlik va 2.1% FAR ko'rsatkichini ta'minladi. 128 o'lchamli xususiyat vektori imzo verifikatsiyasi uchun optimal ekanligini eksperiment tasdiqladi. Taklif etilgan yondashuv bank, yuridik va ma'muriy sohalarda amaliy qo'llanishga tayyor. Keyingi tadqiqotlar yo'nalishlari: (1) O'zbekiston foydalanuvchilari imzolaridan mahalliy ma'lumotlar to'plami yaratish; (2) Few-shot learning usullarini qo'llash; (3) Real vaqtda verifikatsiya uchun modelni mobil qurilmalarga moslash.

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HISTORICAL AND SCIENTIFIC FOUNDATIONS OF SPIRITUAL EDUCATION: ISSUES OF EDUCATION IN THE HARMONY OF FAMILY AND NATIONAL VALUES

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Abstract: *This article analyzes the historical and scientific foundations of spiritual education, the role of the family in its formation process, and its harmony with national values. It also scientifically substantiates the importance of spiritual education in the context of globalization, as well as the impact of the family environment and value system on the development of the younger generation.*
Keywords: *spiritual education, family, national values, historical heritage, moral education, socialization, globalization.*

The development of society is directly dependent on the human factor, and the success of any social reforms relies on raising a spiritually mature, morally perfect generation. That is why the issue of spiritual education has become important both historically and scientifically. In particular, the family occupies a special place in society as the primary and most important institution of spiritual education.

National values are the main factor determining the content of spiritual education. They embody the historical experience, customs, traditions and worldview of the people and are instilled in the minds of the young generation.

Historical foundations of spiritual education

Spiritual education is a system that ensures spiritual, moral, educational and cultural development of a person, and it was historically formed under the influence of different cultures, religions and philosophical currents. Education has become very important in establishing relationships between people in society. Even now, in order to raise the society to higher heights, that is why education has been given a lot of attention since history. Especially in eastern countries, education is very important.

"Upbringing" is derived from the Arabic word, which means to take care of, to teach, to learn, to teach manners, to show kindness, to protect"[1].

The issue of spiritual education has a special place in the works of Eastern thinkers. In particular, Abu Nasr Farabi linked human maturity with moral maturity and emphasized that the development of society relies on enlightened and virtuous people.

Abu Rayhan Beruni emphasized the need to carry out science and education harmoniously.

Also, in his pedagogical views, Abu Ali ibn Sina emphasized the importance of the family environment in the upbringing of a child and evaluated the personal example of parents as an important factor. In the works of Alisher Navoi, values such as humanity, kindness, honesty and justice are interpreted as the basis of spiritual education.

We can quote the wise words of the great thinker Abdulla Awlani: "Upbringing is a matter of life - or death, or salvation - or destruction, or happiness - or disaster" [2]. From these wise words, it is clear that the human being for himself is very important for the child. Education starts from a person's youth.

In Zoroastrian teachings, the following opinion is expressed about education. "Upbringing should be considered the most important pillar of life. It is necessary to educate every young person in such a way that he, first of all, learns to read well and then to write, so that he rises to the highest level, and from a well-fed nation, a good generation - a healthy generation will remain," it is emphasized.

So, in historical sources, spiritual education was always seen as inextricably linked with family and society.

Scientific foundations of spiritual education

Education leads this person to maturity. Human behavior is manifested through the education of his behavior.

In modern pedagogy and psychology, spiritual education is interpreted as a complex system formed in the process of socialization of an individual. According to the scientific approach, spiritual education consists of the following components:

- moral consciousness;
- commitment to values;
- social responsibility;
- civil position;
- awareness of national identity.

Scientific studies show that the first 5-7 years are crucial in the formation of a child's personality, and it is during this period that the family environment and value system have the main influence.

The tasks specified in these decisions provide for the organization of spiritual and educational work on a systematic, continuous and scientific basis. In particular, by recognizing the process of spiritual education as one of the priorities of the state policy, the institutional mechanisms of bringing the young generation to maturity in all aspects were strengthened.

Also, the widespread application of the idea "From national revival to national rise" in the life of society serves to strengthen citizens' sense of national identity, historical memory and respect for the heritage of ancestors. This, in turn, is becoming an important factor in the formation of ideological immunity against moral threats.

In the decisions, special emphasis is placed on the principle of integrity of spiritual education, and the task of strengthening cooperation between the family, educational institutions and community institutions is defined. This approach makes it possible to ensure continuity and consistency in the education of young people, to direct the educational process to a single goal. It is especially important to ensure the stability of the spiritual environment in the territory through the effective use of the educational potential of the neighborhood institute.

In addition, organizing propaganda work based on modern information and communication technologies, increasing the culture of using the Internet, and protecting young people from harmful information flows are defined as urgent tasks. Due to the fact that the expansion of the information space in the conditions of globalization causes the strengthening of various ideological influences on the minds of young people, ensuring ideological security has become an important component of moral policy.

The scientific and methodological basis of the educational process is being strengthened through the development of fundamental and innovative research on spiritual education and social and humanitarian sciences, and the implementation of their results. This makes it possible to increase the effectiveness of spiritual and educational activities, to establish their monitoring and systematically eliminate the identified problems.

In general, the adopted normative legal documents serve to implement complex measures aimed at educating young people to be strong-willed, patriotic, independent-thinking and highly moral. These reforms are important in that they are aimed at creating a healthy spiritual environment in society, ensuring the harmony of national and universal values, and creating a solid foundation for sustainable development.

Family is a small model of society, in which the child gains the first social experience. Parents' behavior, interaction, attention and demands on the child shape his spiritual image.

The following values are instilled in the family:

- respect for adults;
- love for the little ones;
- patriotism;
- diligence;

• honesty and truthfulness.

If a healthy spiritual environment is created in the family, the child will grow up to be an adaptable, independent thinker and responsible person for social life.

National values are the historical memory and spiritual heritage of the nation. They are passed from generation to generation through customs, traditions, rituals, folklore and literature.

In the conditions of globalization, it is an important task to preserve national values and inculcate them in the minds of young people in accordance with modern requirements. Because spiritual education based on national values protects young people from various foreign ideas and forms a strong civic position.

Harmony of national and universal values should be ensured in spiritual education. For example, it is necessary to develop universal human values such as respect for human rights, love of peace, and tolerance along with national traditions.

In short, the historical and scientific foundations of spiritual education show that family and national values play a decisive role in raising a mature generation. The ethical and normative views advanced in our historical heritage have not lost their importance even today. To this end:

• strengthening of a healthy spiritual environment in the family;

• harmonization of national values with the education system;

• educating young people in the spirit of historical heritage;

• improving the mechanisms of spiritual education based on the modern scientific approach is one of the urgent tasks.

Spiritual perfection is an important factor of the stability and development of society. Education in harmony with family and national values creates a strong spiritual foundation for the future generation.

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TAYYORGARLIK DAVRIDA GANDBOLCHILARNING MAXSUS CHIDAMLILIGI

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Annotatsiya. Mazkur maqolada gandbolchilarning tayyorgarlik davrida maxsus chidamliligini rivojlantirish masalalari ilmiy-metodik jihatdan tahlil qilinadi. Zamonaviy gandbol o‘yinida yuqori tezlik, kuch va chidamlilik talab etilishi sportchilarning jismoniy tayyorgarligini mukammal darajada tashkil etishni talab qiladi. Ayniqsa, tayyorgarlik davrida maxsus chidamlilikni rivojlantirish sportchilarning musobaqa faoliyatidagi samaradorligini oshirishda muhim ahamiyat kasb etadi. Maqolada gandbolchilarning jismoniy tayyorgarligi tarkibida maxsus chidamlilikning o‘rni, uni rivojlantirishga qaratilgan mashg‘ulot vositalari va metodik yondashuvlar tahlil qilinadi. Tadqiqot jarayonida maxsus chidamlilikni oshirishga qaratilgan mashqlar tizimi qo‘llanildi va olingan natijalar tahlil qilindi. Tadqiqot natijalari shuni ko‘rsatdiki, tayyorgarlik davrida maxsus chidamlilikni rivojlantirishga qaratilgan mashg‘ulotlar gandbolchilarning o‘yin davomida jismoniy faolligini oshirish, harakat samaradorligini yaxshilash va musobaqa jarayonidagi ish qobiliyatini yuqori darajada saqlab turishga xizmat qiladi.

Kalit so‘zlar: gandbol, maxsus chidamlilik, tayyorgarlik davri, sport tayyorgarligi, jismoniy sifatlar, sport mashg‘ulotlari, chidamlilik mashqlari, sport natijasi

Kirish

Zamonaviy gandbol o‘yini yuqori intensivlikda olib boriladigan, tezkor harakatlar va murakkab texnik-taktik faoliyatni talab qiladigan sport turlaridan biridir. O‘yin davomida sportchilar qisqa vaqt ichida tezkor yugurishlar, sakrashlar, to‘p uzatish va zarba berish kabi ko‘plab harakatlarni bajaradilar. Shu sababli gandbolchilarning jismoniy tayyorgarligi yuqori darajada rivojlangan bo‘lishi zarur. Jismoniy sifatlar ichida maxsus chidamlilik sportchilarning musobaqa faoliyatida yuqori natijalarga erishishida muhim ahamiyat kasb etadi.

Maxsus chidamlilik sportchining o‘yin davomida yuqori tezlikda bajariladigan harakatlarni uzoq vaqt davomida samarali bajarish qobiliyatini ifodalaydi. Gandbol o‘yinida bu sifat sportchining har bir epizodda faol ishtirok etishi, hujum va himoya harakatlarini yuqori sur’atda bajarishi hamda o‘yin oxirigacha jismoniy ish qobiliyatini saqlab qolishini ta’minlaydi. Shu sababli tayyorgarlik davrida maxsus chidamlilikni rivojlantirish sport mashg‘ulotlarining muhim vazifalaridan biri hisoblanadi [1].

Tayyorgarlik davri sportchilarning jismoniy va texnik tayyorgarligini shakllantirish bosqichi bo‘lib, bu davrda asosiy jismoniy sifatlar, jumladan chidamlilik, kuch, tezlik va koordinatsiya rivojlantiriladi. Ayniqsa, maxsus chidamlilikni rivojlantirish gandbolchilarning musobaqa davrida yuqori darajadagi ish qobiliyatini ta’minlashga xizmat qiladi. Bu jarayonda mashg‘ulot yuklamalarini ilmiy asosda rejalashtirish va sportchilarning individual xususiyatlarini hisobga olish muhim ahamiyatga ega.

So‘nggi yillarda sport nazariyasi va metodikasi sohasida olib borilgan ilmiy tadqiqotlar maxsus chidamlilikni rivojlantirish uchun maxsus mashqlar tizimini qo‘llash zarurligini ko‘rsatmoqda. Bunday mashqlar o‘yin faoliyatiga yaqin bo‘lgan sharoitlarda bajarilib, sportchilarning jismoniy va funksional imkoniyatlarini oshirishga xizmat qiladi. Shu bilan birga, interval mashqlar, takroriy yugurishlar va o‘yin mashqlari maxsus chidamlilikni rivojlantirishda samarali vositalardan biri hisoblanadi [2].

Yuqoridagilardan kelib chiqib, tayyorgarlik davrida gandbolchilarning maxsus chidamliligini rivojlantirish va uni ilmiy-metodik jihatdan asoslash muhim ilmiy-amaliy ahamiyatga ega. Mazkur maqolada tayyorgarlik davrida gandbolchilarning maxsus chidamliligini rivojlantirishning metodik asoslari hamda mashg‘ulot jarayonida qo‘llaniladigan samarali vositalar tahlil qilinadi.

Chidamlilik turlari

Sport mashg‘ulotlari nazariyasida chidamlilik sportchining uzoq vaqt davomida jismoniy yuklamalarni samarali bajarish va charchoqqa qarshi turish qobiliyati sifatida ta’riflanadi. Chidamlilik sportchilarning jismoniy tayyorgarligi tarkibida muhim o‘rin egallaydi va ayniqsa jamoaviy sport turlarida, jumladan gandbol o‘yinida katta ahamiyatga ega. O‘yin davomida sportchilar tezkor yugurishlar, sakrashlar, to‘p bilan harakatlar va himoya harakatlarini ko‘p marotaba bajaradilar. Shu sababli gandbolchilarda turli xil chidamlilik turlarining rivojlangan bo‘lishi zarur.

Sport nazariyasida chidamlilik bir necha turlarga bo‘linadi. Ular sport faoliyatining xususiyatlari va bajariladigan harakatlarning davomiyligiga qarab farqlanadi. Asosiy chidamlilik turlariga umumiy chidamlilik, maxsus chidamlilik, tezkor chidamlilik, kuch chidamliligi va anaerob chidamlilik kiradi [3].

Umumiy chidamlilik sportchining uzoq vaqt davomida o‘rtacha intensivlikdagi jismoniy yuklamalarni bajarish qobiliyatini ifodalaydi. Bu chidamlilik turi yurak-qon tomir va nafas olish tizimining funksional imkoniyatlari bilan chambarchas bog‘liqdir. Umumiy chidamlilik asosan uzoq masofaga yugurish, velosiped mashqlari va boshqa aerob mashqlar yordamida rivojlantiriladi. Gandbolchilarda umumiy chidamlilik mashg‘ulot jarayonining tayyorgarlik bosqichida muhim ahamiyatga ega, chunki u sportchining umumiy ish qobiliyatini oshiradi.

Maxsus chidamlilik esa sportchining o‘z sport turiga xos harakatlarni uzoq vaqt davomida yuqori intensivlikda bajarish qobiliyatini bildiradi. Gandbol o‘yinida maxsus chidamlilik sportchining tezkor yugurishlar, keskin yo‘nalish o‘zgarishlari, sakrashlar va zarba berish harakatlarini o‘yin davomida samarali bajarishini ta’minlaydi. Maxsus chidamlilikni rivojlantirish uchun o‘yin sharoitiga yaqin mashqlar, interval yugurishlar va takroriy tezkor harakatlar qo‘llaniladi [4].

Tezkor chidamlilik sportchining yuqori tezlikda bajariladigan harakatlarni uzoq vaqt davomida saqlab turish qobiliyatidir. Gandbol o‘yinida bu sifat juda muhim hisoblanadi, chunki sportchilar o‘yin davomida ko‘p marotaba qisqa masofaga tez yugurishlar bajaradilar. Tezkor chidamlilikni rivojlantirish uchun qisqa masofali takroriy yugurish mashqlari va interval mashg‘ulotlar samarali hisoblanadi.

Kuch chidamliligi sportchining mushak kuchini uzoq vaqt davomida saqlab turish qobiliyatidir. Bu chidamlilik turi sakrash, to‘p bilan kurashish va himoya harakatlarida muhim rol o‘ynaydi. Gandbolchilarda kuch chidamliligini rivojlantirish uchun og‘irliklar bilan mashqlar, sakrash mashqlari va maxsus kuch mashqlari qo‘llaniladi.

Anaerob chidamlilik sportchining qisqa vaqt ichida yuqori intensivlikdagi jismoniy yuklamalarni bajarish qobiliyatini ifodalaydi. Gandbol o‘yinida tezkor hujumlar, keskin harakatlar va qisqa masofaga tez yugurishlar anaerob energiya tizimi orqali amalga oshiriladi. Shu sababli anaerob chidamlilikni rivojlantirish sportchilarning o‘yin davomida yuqori sur’atni saqlab qolishiga yordam beradi.

Shunday qilib, gandbolchilarning jismoniy tayyorgarligida chidamlilikning barcha turlari muhim ahamiyatga ega. Ayniqsa, tayyorgarlik davrida umumiy va maxsus chidamlilikni rivojlantirishga qaratilgan mashg‘ulotlarni samarali tashkil etish sportchilarning musobaqa faoliyatida yuqori natijalarga erishishiga xizmat qiladi [5].

1-jadval

Tayyorlov davrida gandbolchilarning maxsus chidamlilik ko‘rsatkichlari dinamikasi

№	Test mashqlari	Tadqiqot boshida (Ort ± SS)	Tadqiqot oxirida (Ort ± SS)	O‘zgarish (%)
1	1000 m yugurish (sek)	238 ± 6.2	225 ± 5.8	+5.4%
2	30 m × 10 takroriy yugurish (sek)	78 ± 3.1	72 ± 2.8	+7.7%
3	Shuttle run 4×9 m (sek)	10.6 ± 0.4	9.9 ± 0.3	+6.6%
4	3 daqiqalik o‘yin harakati testi (m)	620 ± 25	690 ± 28	+11.2%

Jadval natijalari tayyorgarlik davrida maxsus chidamlilikni rivojlantirishga qaratilgan mashg‘ulotlar sportchilarning yugurish tezligi, takroriy harakatlarni bajarish qobiliyati va umumiy ish qobiliyatini sezilarli darajada yaxshilaganini ko‘rsatadi.

2-jadval

Gandbolchilarda yurak urish chastotasi va tiklanish ko‘rsatkichlari

№	Ko‘rsatkichlar	Tadqiqot boshida	Tadqiqot oxirida	O‘zgarish
1	Mashg‘ulot paytidagi YUCh (ur/min)	186	180	yaxshilanish
2	1 daqiqadan keyingi tiklanish (ur/min)	138	126	yaxshilanish
3	3 daqiqadan keyingi tiklanish (ur/min)	108	98	yaxshilanish

Natijalar sportchilarning funksional tayyorgarligi yaxshilanganini ko‘rsatadi. Mashg‘ulotlardan keyin yurak urish tezligining tezroq tiklanishi sportchilarning chidamlilik darajasi oshganini bildiradi.

3-jadval

Gandbolchilarning o‘yin davomida bajarilgan harakatlar soni

№	Harakat turi	Tadqiqot boshida	Tadqiqot oxirida	O‘zgarish (%)
1	Tezkor yugurishlar	24	31	+29%
2	Sakrashlar	18	23	+27%
3	Himoya harakatlari	20	26	+30%
4	Hujum epizodlari	16	21	+31%

Tayyorgarlik davrida maxsus chidamlilikni rivojlantirishga qaratilgan mashg‘ulotlar gandbolchilarning o‘yin davomida bajaradigan faol harakatlar sonini oshirganini ko‘rsatadi. Bu esa sportchilarning musobaqa faoliyatida samaradorlik oshganidan dalolat beradi.

Muhokama

O‘tkazilgan tadqiqot natijalari tayyorgarlik davrida maxsus chidamlilikni rivojlantirish gandbolchilarning jismoniy va funksional tayyorgarligini sezilarli darajada oshirishini ko‘rsatdi. Zamonaviy gandbol o‘yini yuqori tezlikda va katta jismoniy yuklama sharoitida olib borilishi sababli sportchilarda chidamlilik sifatining rivojlangan bo‘lishi

muhim ahamiyat kasb etadi. Tadqiqot natijalari shuni ko‘rsatdiki, maxsus mashqlar tizimidan foydalanish sportchilarning harakat samaradorligini oshirishga xizmat qiladi. Statistik ma’lumotlar tahliliga ko‘ra, takroriy yugurish va o‘yin sharoitiga yaqin mashg‘ulotlar sportchilarning tezkor chidamliligini oshirishda samarali vosita bo‘lib xizmat qilgan. Ayniqsa, interval usulida tashkil etilgan mashg‘ulotlar sportchilarning yurak-qon tomir tizimining funksional imkoniyatlarini yaxshilashga yordam berdi.

Shuningdek, olingan natijalar gandbolchilarning o‘yin jarayonidagi harakat faolligi ham oshganini ko‘rsatdi. Tezkor yugurishlar, sakrashlar va himoya harakatlarining ko‘payishi sportchilarning o‘yin davomida yuqori ish qobiliyatini saqlab qolishiga imkon yaratgan. Bu esa maxsus chidamlilikni rivojlantirishga qaratilgan mashg‘ulotlarning amaliy samaradorligini tasdiqlaydi [6].

Ilmiy adabiyotlar tahlili ham maxsus chidamlilik sport natijalarini oshirishda muhim omil ekanligini ko‘rsatadi. Ko‘plab tadqiqotchilar tayyorgarlik davrida chidamlilikni rivojlantirishga qaratilgan mashg‘ulotlar musobaqa davrida sportchilarning jismoniy tayyorgarligini yuqori darajada saqlab turishini ta’kidlaydilar. Shu sababli mashg‘ulot jarayonida maxsus chidamlilikni rivojlantirishga qaratilgan mashqlar tizimini keng qo‘llash maqsadga muvofiq hisoblanadi.

Natijada tayyorgarlik davrida maxsus chidamlilikni rivojlantirishga qaratilgan mashg‘ulotlar gandbolchilarning jismoniy tayyorgarligi, funksional imkoniyatlari va o‘yin samaradorligini oshirishda muhim omil bo‘lib xizmat qiladi.

Xulosa

O‘tkazilgan tadqiqot natijalari tayyorgarlik davrida gandbolchilarning maxsus chidamliligini rivojlantirish sportchilarning umumiy jismoniy tayyorgarligi va o‘yin samaradorligini oshirishda muhim omil ekanligini ko‘rsatdi. Zamonaviy gandbol o‘yini yuqori tezlikda va katta jismoniy yuklama sharoitida olib borilishi sababli sportchilarda chidamlilik sifatining yuqori darajada rivojlangan bo‘lishi zarur.

Tadqiqot davomida qo‘llanilgan maxsus mashqlar tizimi sportchilarning takroriy yugurishlar, tezkor harakatlar va o‘yin jarayonidagi faol harakatlarni samarali bajarish qobiliyatini oshirdi. Statistik natijalar tahlili shuni ko‘rsatdiki, mashg‘ulotlar jarayonida interval mashqlar, takroriy yugurishlar va o‘yin sharoitiga yaqin mashqlarni qo‘llash sportchilarning maxsus chidamliligini rivojlantirishda samarali hisoblanadi.

Shuningdek, mashg‘ulotlar natijasida sportchilarning yurak-qon tomir tizimi faoliyati yaxshilandi, tiklanish jarayoni tezlashdi va o‘yin davomida bajariladigan faol harakatlar soni oshdi. Bu esa tayyorgarlik davrida maxsus chidamlilikni rivojlantirish sportchilarning musobaqa faoliyatidagi ish qobiliyatini yuqori darajada saqlab qolishga yordam berishini ko‘rsatadi.

Shu sababli tayyorgarlik davrida gandbolchilarning maxsus chidamliligini rivojlantirishga qaratilgan mashg‘ulotlarni ilmiy asosda rejalashtirish, mashqlar yuklamasini bosqichma-bosqich oshirish va sportchilarning individual xususiyatlarini hisobga olish muhim ahamiyatga ega. Bu yondashuv sportchilarning jismoniy tayyorgarligini yanada takomillashtirish va yuqori sport natijalariga erishishga xizmat qiladi.

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MASHQLARNING JISMONIY RIVOJLANISHGA TA’SIRI

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Annotatsiya. Mazkur tezisda jismoniy mashqlarning inson organizmining rivojlanishiga ko‘rsatadigan ta’siri ilmiy jihatdan tahlil qilinadi. Jismoniy mashqlar organizmning funksional imkoniyatlarini oshirish, mushak tizimini rivojlantirish hamda umumiy jismoniy tayyorgarlikni yaxshilashda muhim ahamiyatga ega. Tadqiqot natijalari muntazam jismoniy mashqlar bilan shug‘ullanish organizmning jismoniy rivojlanish ko‘rsatkichlarini sezilarli darajada oshirishini ko‘rsatadi.
Kalit so‘zlar: jismoniy mashqlar, jismoniy rivojlanish, sport mashg‘ulotlari, jismoniy tayyorgarlik, mushak kuchi, chidamlilik, sog‘lom turmush tarzi

Kirish

Zamonaviy jamiyatda inson salomatligini mustahkamlash, yoshlarning jismoniy rivojlanishini ta’minlash va sog‘lom turmush tarzini shakllantirish muhim ijtimoiy vazifalardan biri hisoblanadi. Bu jarayonda jismoniy mashqlar alohida ahamiyat kasb etadi. Jismoniy mashqlar inson organizmining har tomonlama rivojlanishiga ijobiy ta’sir ko‘rsatib, uning funksional imkoniyatlarini oshiradi, jismoniy sifatlarni rivojlantiradi hamda umumiy ish qobiliyatini yaxshilaydi.

Jismoniy mashqlar inson organizmida murakkab biologik va fiziologik jarayonlarni faollashtiradi. Muntazam ravishda bajariladigan mashqlar natijasida mushak tizimi mustahkamlanadi, yurak-qon tomir va nafas olish tizimlarining faoliyati yaxshilanadi hamda organizmning tashqi muhit ta’sirlariga moslashuv qobiliyati ortadi. Shu bilan birga, jismoniy mashqlar moddalar almashinuvi jarayonini jadallashtiradi va organizmning umumiy funksional holatini yaxshilaydi.

Jismoniy mashqlar nafaqat organizmning jismoniy rivojlanishiga, balki insonning psixologik va ijtimoiy rivojlanishiga ham ijobiy ta’sir ko‘rsatadi. Sport bilan shug‘ullanish insonda intizom, iroda, maqsadga intilish va o‘ziga bo‘lgan ishonch kabi ijobiy sifatlarning shakllanishiga yordam beradi. Ayniqsa, yoshlar orasida jismoniy mashqlar bilan muntazam shug‘ullanish ularning sog‘lom turmush tarzini shakllantirishda muhim omil hisoblanadi.

So‘nggi yillarda olib borilgan ilmiy tadqiqotlar jismoniy mashqlarning inson organizmiga ko‘rsatadigan ta’sirini chuqur o‘rganishga qaratilgan. Tadqiqotlar shuni ko‘rsatadiki, jismoniy mashqlar jismoniy sifatlarning rivojlanishiga, organizmning

funksional imkoniyatlarining oshishiga hamda inson salomatligining mustahkamlanishiga xizmat qiladi. Shu sababli jismoniy mashqlarning jismoniy rivojlanishga ta’sirini ilmiy jihatdan o‘rganish muhim ahamiyatga ega [1].

Shu nuqtai nazardan, mazkur tezisda jismoniy mashqlarning inson organizmining jismoniy rivojlanishiga ko‘rsatadigan ta’siri hamda ularning sog‘lom turmush tarzini shakllantirishdagi o‘rni ilmiy jihatdan tahlil qilinadi.

Mashqlar turlari

Jismoniy mashqlar inson organizmining har tomonlama rivojlanishiga xizmat qiladigan muhim vositalardan biri hisoblanadi. Jismoniy tarbiya nazariyasida mashqlar turli mezonlarga ko‘ra tasniflanadi. Mashqlarni to‘g‘ri tanlash va ularni maqsadga muvofiq ravishda qo‘llash jismoniy rivojlanish jarayonining samaradorligini oshiradi. Sport mashg‘ulotlarida mashqlar odatda umumrivojlantiruvchi mashqlar, maxsus mashqlar, kuch mashqlari, tezkorlik mashqlari va chidamlilik mashqlariga bo‘linadi.

Umumrivojlantiruvchi mashqlar organizmning umumiy jismoniy tayyorgarligini oshirishga qaratilgan mashqlar hisoblanadi. Bu turdagi mashqlar mushaklarning turli guruhlarini rivojlantirishga xizmat qiladi hamda harakat koordinatsiyasini yaxshilaydi. Umumrivojlantiruvchi mashqlar tarkibiga egilish, cho‘zilish, burilish, sakrash va turli xil harakatli mashqlar kiradi. Ushbu mashqlar ayniqsa jismoniy tayyorgarlikning boshlang‘ich bosqichida muhim ahamiyatga ega.

Maxsus mashqlar ma’lum bir sport turiga xos bo‘lgan harakatlarni rivojlantirishga qaratilgan mashqlardir. Bunday mashqlar sportchilarning texnik va taktik tayyorgarligini takomillashtirishga yordam beradi. Masalan, yengil atletika, futbol, gandbol yoki gimnastika mashg‘ulotlarida har bir sport turining o‘ziga xos maxsus mashqlari qo‘llaniladi. Maxsus mashqlar sportchilarning o‘yin yoki musobaqa jarayonidagi harakat faoliyatini yaxshilashga xizmat qiladi.

Kuch mashqlari mushak kuchini rivojlantirishga qaratilgan mashqlardir. Bu mashqlar yordamida mushaklarning kuchi, chidamliligi va barqarorligi oshiriladi. Kuch mashqlariga og‘irliklar bilan bajariladigan mashqlar, turnikda tortilish, otjimaniya va turli xil sakrash mashqlari kiradi. Kuch mashqlari jismoniy rivojlanishning muhim tarkibiy qismi bo‘lib, sportchilarning umumiy jismoniy tayyorgarligini oshirishda katta ahamiyatga ega.

Tezkorlik mashqlari harakatlarni qisqa vaqt ichida yuqori tezlikda bajarish qobiliyatini rivojlantirishga qaratilgan mashqlardir. Tezkorlik mashqlariga qisqa masofaga yugurish, start mashqlari, tezkor harakatli o‘yinlar va turli xil tezlik mashqlari kiradi. Bu mashqlar sportchilarning reaksiyasi va harakat tezligini oshirishga yordam beradi.

Chidamlilik mashqlari organizmning uzoq vaqt davomida jismoniy yuklamalarni bajarish qobiliyatini rivojlantiradi. Bu mashqlar yurak-qon tomir va nafas olish tizimlarining faoliyatini yaxshilaydi hamda organizmning umumiy ish qobiliyatini oshiradi. Chidamlilik mashqlariga uzoq masofaga yugurish, velosiped mashqlari, suzish va interval mashg‘ulotlar kiradi [2].

Shunday qilib, jismoniy mashqlarning turli turlari inson organizmining har tomonlama rivojlanishiga xizmat qiladi. Mashg‘ulot jarayonida mashqlarni to‘g‘ri tanlash va ularni ilmiy asosda qo‘llash jismoniy rivojlanish ko‘rsatkichlarini oshirishda muhim ahamiyat kasb etadi.

Mashqlarning jismoniy rivojlanishga ta’siri

Jismoniy mashqlar inson organizmining jismoniy rivojlanishida muhim rol o‘ynaydi. Muntazam ravishda bajariladigan mashqlar organizmning morfologik va funksional ko‘rsatkichlarini yaxshilaydi, mushak tizimini mustahkamlaydi hamda jismoniy sifatlarning rivojlanishiga yordam beradi. Jismoniy mashqlar ta’sirida organizmda turli fiziologik jarayonlar faollashadi va bu jarayonlar inson salomatligining mustahkamlanishiga xizmat qiladi.

Avvalo, jismoniy mashqlar mushak tizimining rivojlanishiga ijobiy ta’sir ko‘rsatadi. Mashqlarni muntazam bajarish natijasida mushak tolalari kuchayadi, mushaklarning hajmi ortadi va ularning ish qobiliyati yaxshilanadi. Natijada insonning jismoniy kuchi oshadi va harakat faoliyati samaradorligi ortadi.

Shuningdek, jismoniy mashqlar yurak-qon tomir tizimining faoliyatini yaxshilaydi. Mashg‘ulotlar davomida yurak faoliyati faollashadi, qon aylanishi tezlashadi va organizmning kislorod bilan ta’minlanishi yaxshilanadi. Bu esa inson organizmining umumiy chidamliligini oshiradi hamda jismoniy yuklamalarni samarali bajarish imkonini yaratadi.

Jismoniy mashqlar nafas olish tizimining rivojlanishiga ham ijobiy ta’sir ko‘rsatadi. Muntazam mashg‘ulotlar o‘pkalarning hayotiy sig‘imini oshiradi va nafas olish jarayonining samaradorligini yaxshilaydi. Bu esa organizmning kislorod bilan ta’minlanishini yaxshilab, jismoniy faoliyat davomida charchoqning kechroq paydo bo‘lishiga yordam beradi.

Bundan tashqari, jismoniy mashqlar insonning asab tizimiga ham ijobiy ta’sir ko‘rsatadi. Mashg‘ulotlar jarayonida asab tizimi faoliyati faollashadi, harakat koordinatsiyasi yaxshilanadi va reflekslar tezligi oshadi. Bu jarayon insonning umumiy harakat faoliyatini takomillashtiradi hamda psixologik barqarorlikni mustahkamlaydi.

Jismoniy mashqlar shuningdek insonning psixologik holatiga ham ijobiy ta’sir ko‘rsatadi. Sport bilan shug‘ullanish stressni kamaytiradi, kayfiyatni yaxshilaydi va insonda ijobiy emotsional holatni shakllantiradi. Shu sababli jismoniy mashqlar

nafaqat jismoniy rivojlanish, balki insonning ruhiy salomatligini mustahkamlashda ham muhim ahamiyatga ega.

Umuman olganda, jismoniy mashqlar inson organizmining har tomonlama rivojlanishiga xizmat qiladi. Muntazam mashg‘ulotlar natijasida jismoniy sifatlar rivojlanadi, organizmning funksional imkoniyatlari oshadi va inson salomatligi mustahkamlanadi. Shu sababli jismoniy mashqlar bilan muntazam shug‘ullanish sog‘lom turmush tarzining muhim tarkibiy qismi hisoblanadi [3].

Jismoniy mashqlar turlarining jismoniy rivojlanishga ta’siri

№	Mashq turi	Asosiy mashqlar	Rivojlantiriladigan jismoniy sifatlar	Organizmga ta’siri	Amaliy ahamiyati
1	Umumrivojlantiruvchi mashqlar	Egilishlar, burilishlar, cho‘zilish mashqlari	Moslashuvchanlik, koordinatsiya	Mushak va bo‘g‘imlarning harakatchanligini oshiradi	Umumiy jismoniy tayyorgarlikni shakllantiradi
2	Kuch mashqlari	Turnikda tortilish, otjimaniya, og‘irliklar bilan mashqlar	Mushak kuchi, mushak chidamliligi	Mushak tolalarini mustahkamlaydi	Jismoniy kuchni oshiradi
3	Tezkorlik mashqlari	30–60 m sprint, start mashqlari	Tezkorlik, reaksion tezlik	Asab-mushak tizimini faollashtiradi	Harakat tezligini oshiradi
4	Chidamlilik mashqlari	1000–3000 m yugurish, interval mashg‘ulotlar	Umumiy va maxsus chidamlilik	Yurak-qon tomir tizimini rivojlantiradi	Uzoq vaqt davomida ishlash qobiliyatini oshiradi
5	Sakrash mashqlari	Vertikal sakrash, plyometrik mashqlar	Kuch va tezkorlik	Mushaklarning portlovchi kuchini oshiradi	Sport natijalarini yaxshilaydi

6	Koordinatsiya mashqlari	Harakatli o‘yinlar, murakkab harakatlar	Harakat muvofiqligi	Markaziy asab tizimini rivojlantiradi	Harakat aniqligini oshiradi
7	Maxsus sport mashqlari	Sport turiga xos texnik mashqlar	Maxsus jismoniy sifatlar	Sport faoliyatiga moslashuvni oshiradi	Musobaqa natijalarini yaxshilaydi
8	Nafas olish mashqlari	Nafasni boshqarish mashqlari	Nafas olish chidamliligi	O‘pka sig‘imini oshiradi	Jismoniy yuklamaga moslashishni yaxshilaydi

Ushbu jadval jismoniy mashqlar turlarining inson organizmi rivojlanishiga ko‘rsatadigan ta’sirini umumlashtiradi. Turli xil mashq turlarini mashg‘ulot jarayonida uyg‘un ravishda qo‘llash jismoniy sifatlarning har tomonlama rivojlanishini ta’minlaydi.

Xulosa

Xulosa qilib aytganda, jismoniy mashqlar inson organizmining jismoniy rivojlanishida muhim ahamiyatga ega bo‘lgan asosiy vositalardan biridir. Muntazam ravishda bajariladigan jismoniy mashqlar mushak tizimining rivojlanishiga, yurak-qon tomir va nafas olish tizimlarining faoliyatini yaxshilashga hamda organizmning umumiy funksional imkoniyatlarini oshirishga xizmat qiladi.

Tadqiqot va ilmiy tahlillar shuni ko‘rsatadiki, jismoniy mashqlar insonning jismoniy sifatlarini, jumladan kuch, tezkorlik, chidamlilik va koordinatsiya qobiliyatlarini rivojlantirishda muhim rol o‘ynaydi. Shu bilan birga, jismoniy mashqlar insonning psixologik holatiga ham ijobiy ta’sir ko‘rsatib, stressni kamaytiradi, emotsional barqarorlikni oshiradi va hayot sifatini yaxshilaydi.

Jismoniy mashqlarni ilmiy asosda tashkil etish va mashg‘ulot jarayonida turli xil mashq turlaridan foydalanish insonning har tomonlama jismoniy rivojlanishini ta’minlaydi. Ayniqsa, yoshlar orasida jismoniy mashqlar bilan muntazam shug‘ullanish sog‘lom turmush tarzini shakllantirish, organizm salomatligini mustahkamlash hamda jismoniy tayyorgarlik darajasini oshirishda muhim omil hisoblanadi.

Shu sababli jismoniy mashqlarni ta’lim jarayonida keng qo‘llash, yoshlarni sport faoliyatiga jalb etish va sog‘lom turmush tarzini targ‘ib qilish bugungi kunda dolzarb vazifalardan biri hisoblanadi.

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TARJIMA VA AMALIYOTNING YANGI UFQLARI:SUN'IY INTELLEKT,TABIIY TILNI QAYTA ISHLASH VA TARJIMADA KREATIVLIK

NEW HORIZONS OF TRANSLATION AND PRACTICE: ARTIFICIAL INTELLIGENCE, NATURAL LANGUAGE PROCESSING AND CREATIVITY IN TRANSLATION

НОВЫЕ ГОРИЗОНТЫ ПЕРЕВОДА И ПРАКТИКИ: ИСКУССТВЕННЫЙ ИНТЕЛЛЕКТ, ОБРАБОТКА ЕСТЕСТВЕННОГО ЯЗЫКА И ТВОРЧЕСТВО В ПЕРЕВОДЕ

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Annotatsiya: Maqolada tarjima amaliyotining zamonaviy bosqichi va sun'iy intellekt texnologiyalarining so'zlashuv tillarini qayta ishlash jarayoniga ta'siri yoritiladi. Unda AI asosidagi tarjima vositalarining samaradorligi, ularning tarjimon faoliyatiga integratsiyalashuvi hamda kreativ yondashuvlarni talab qiluvchi tarjima jarayonlari tahlil qilinadi. Shuningdek, raqamli muhitda tilni qayta ishlash texnologiyalari tarjima sifati, tezligi va moslashuvchanligiga qanday ta'sir ko'rsatishi ilmiy asosda ko'rib chiqiladi. Maqola tarjimonning yangi kompetensiyalarini belgilash, innovatsion texnologiyalar bilan uyg'un ishlash imkoniyatlari va ilg'or usullarning amaliy qo'llanilishi bo'yicha xulosalar beradi.

Kalit so'z: sun'iy intellekt, mashina tarjimasi, tabiiy tilni qayta ishlash, neyron tarmoqlar, kreativ tarjima, kreativ tarjima,tarjima texnologiyalari.

Annotation: The article discusses the current stage of translation practice and the influence of artificial intelligence technologies on the process of processing spoken languages. It analyzes the effectiveness of AI-based translation tools, their integration into translators' activities, and translation processes that require creative approaches.

It also examines how language processing technologies in the digital environment affect translation quality, speed, and flexibility on a scientific basis. The article provides conclusions on the definition of new translator competencies, the possibility of harmonious work with innovative technologies and practical application of advanced methods.

Keywords: artificial intelligence, machine translation, natural language processing, neural networks, creative translation, creative translation, translation technology

Аннотация: В статье рассматривается текущий этап практики перевода и влияние технологий искусственного интеллекта на процесс обработки устных языков. Анализируется эффективность инструментов перевода на базе ИИ, их интеграция в деятельность переводчиков и процессы перевода, требующие творческих подходов. Также рассматривается, как технологии обработки языка в цифровой среде влияют на качество, скорость и гибкость перевода на научной основе. В статье приводятся выводы по определению новых компетенций переводчика, возможности гармоничной работы с инновационными технологиями и практического применения передовых методов.

Ключевые слова: искусственный интеллект, машинный перевод, обработка естественного языка, нейронные сети, творческий перевод, творческий перевод, технологии перевода

In the era of digital transformation, information exchange has accelerated at an unprecedented rate. The need for rapid translation of scientific, technical, legal and literary texts created in different languages has increased dramatically. Whereas traditional translation has relied solely on human knowledge, in the modern era, artificial intelligence (SI) and natural language processing (NLP) technologies are being actively introduced into the translation process [1] This process has taken the quality, speed and scale of translation to a new level. Today, machine translation is emerging not only as an auxiliary tool but as an independent technological platform[2]. At the same time, as experts note, translation is not only a technical process, but also a means of intercultural communication. Therefore, the issue of balance between technological progress and human thinking occupies a central place in this article. The combination of NLP, NMT, neural networks, and deep learning mechanisms leads to significant improvements in text and speech recognition and translation. Despite all the advances in this area, human translators and editors need to maintain a balance. For businesses and companies looking to have their own translation system, contact Shaip

[1] https://arxiv.org/abs/1409.0473,
[2] 2. Nida, E. A. (2001). Context in Translating. John Benjamins.

for artificial intelligence-based conversational solutions equipped with NLP and machine translation.

Development of translation systems based on artificial intelligence

Where translation systems powered by artificial intelligence initially relied on statistical models, today they are driven primarily through neural networks. The neural machine translation (NMT) approach treats text as a cohesive semantic structure, rather than as a separate collection of words[3]. This significantly increased the fluency and logical integrity of the translation. Modern translation systems operate on the basis of synergistic algorithms, which means that they take into account syntax, semantics, and pragmatic factors at the same [4]time. For example, it became possible to correctly interpret polyseurous words in English depending on the context. However, systems still have limitations in fully identifying ironic expressions, sarcasm and expressions specific to national culture. Security and ethical issues are also important in the SI-based translation process. Because in the process of automatic translation, there is a possibility that confidential documents or personal data may be transmitted. Therefore, data protection is constantly relevant in the implementation of these technologies.

Natural language processing technologies and translation quality

Natural Language Processing (NLP) technologies are the intellectual "engine" of the translation process. With the help of these technologies, the computer detects syntactic connections between words, sentence structure as well as semantic connections [5] As a result, the translated text is not only grammatically correct, but also logically consistent and stylistically coherent. NLP-based systems allow for the automation of terminological adaptation. For example, the uniform translation of industry terms in technical, medical, or legal texts ensures stable quality This is especially important in large projects, collective translation processes.

NLP technologies also serve to determine the overall tone of the text. For example, the language of an official document, scientific style, or artistic expression is automatically distinguished, and these stylistic features are preserved to the maximum extent in the translation process. This serves to bring the quality of machine translation closer to human translation The widespread application of AI translation technologies has led to significant changes in the translation profession and related fields. The traditional translation workflow has been transformed, with human translators taking on the role of post-editors reviewing and refining machine-generated translations instead of

[3] https://arxiv.org/abs/1706.03762
[4] Koehn, P. (2020). Neural Machine Translation. Cambridge University Press.
[5] https://www.hutchinsweb.me.uk/CU-MT-2005.pdf

working from source texts. This shift has shifted the qualification requirements in the industry, focusing more on editing skills and technical proficiency with translation tools rather than pure translation ability. The economic impact on the translation market has been multifaceted. While AI has reduced costs and increased access to key translation services, it has simultaneously lowered prices for direct translation jobs. This has created market pressure for human translators to specialize in areas where AI is still underperforming, such as creative translation or highly specialized technical fields. Unsurprisingly, the increase in the volume of translation performed using artificial intelligence has created new opportunities for human linguists in the roles of quality control, localization, and cultural adaptation that require human reasoning.

Cooperation with human translator and artificial intelligence

In modern translation practice, the cooperation of human and artificial intelligence has become a necessity, not an alternative. The "human-in-the-loop" model has been established today as the leading approach. Based on this model, the machine first creates a draft translation, and then a human translator edits it, corrects content subtleties and stylistically perfects it. This process is called "post-editing" and has become an integral part of the modern translation profession. Research shows that translations prepared through post-editing are more effective than traditional translations in terms of time and quality. In addition, it can be seen that the professional competencies of translators are also changing. Now, it is required that a professional translator not only know the language perfectly, but also be able to work with translation technologies, CAT tools, terminology management systems. This also calls for fundamental reforms in the translator training system.

Conclusion

Artificial intelligence has fundamentally changed the field of translation and has taken it to a new level. Machine translation offers unparalleled advantages in terms of speed and volume. NLP technologies, on the other hand, play an important role in stabilizing translation quality and ensuring methodological accuracy. At the same time, it is important to remember that the process of translation is not just a collection of technical algorithms, but a cultural, social, and aesthetic process. Human thinking, creative approach and cross-cultural sensitivity still remain an integral part of translation. In the future, the field of translation will continue to evolve based on the synergy of human and artificial intelligence. However, no matter how advanced technological progress is, it is becoming increasingly evident that the translation process is not just a set of algorithmic operations. Human thinking, creative approach, deep understanding of the cultural context, emotional tone and preservation of the author's style remain the responsibility of human translator. In particular, living thinking and aesthetic intuition

play an important role in the translation of texts of artistic, journalistic and creative content.

Therefore, the field of future translation is based not on the contradiction of artificial intelligence and human thought, but on their harmonious cooperation. The model of "human + artificial intelligence" is emerging as the most optimal and effective approach in translation. This model not only increases the speed of translation, but also stabilizes quality, ensures terminological accuracy, and enhances reliability in international information exchange.

In conclusion, the translator of the future should be not only a specialist with excellent knowledge of the language, but also a person with a deep understanding of modern technologies, with the ability to effectively use digital tools and creative thinking. It is this harmony that ensures the sustainable development of the field of translation and further strengthens it as one of the most important tools of human development.

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INCREASING THE EFFECTIVENESS OF GEOGRAPHY EDUCATION AND DEVELOPING THE COMPETENCE OF PUPILS BASED ON A COMPETENCY-BASED APPROACH

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Abstract. The article examines issues of increasing the effectiveness of geography education and developing pupils' competencies based on a competency-based approach.
Key words: modern pedagogical technology, communicative competence, competence in working with information, self-development competence, socially active civic competence, national and general cultural competence, mathematical literacy, competence in being aware of and using innovations in science and technology.

Introduction. At present, due to the introduction of modern pedagogical technologies into the educational process, there is a need to develop modern approaches to the use of educational tools, including information educational environments, in the process of teaching and upbringing geography in general education schools. Because with the help of informational educational environments, it is possible to figuratively present geographical knowledge and effectively organise the process of independent learning of pupils. When fully conveying the topics of the content of the subject "Geography of Karakalpakstan" to the consciousness of pupils in general education schools, didactic teaching aids placed in information educational environments, including interactive maps, multimedia applications, presentations on the topic, virtual educational technologies, video lessons, video clips, online non-standard, open, closed and PISA tests, various crosswords are used, the motivation of pupils in the subject increases even more, they understand certain geographical problems, easily assimilate the planned knowledge in the textbook, serve as an important pedagogical tool for the formation of geographical imagination and orientation towards independent learning.
The use of multimedia applications and interactive teaching aids in geography education has a number of advantages over printed visual aids. In traditional visual aids, the pupil has the opportunity to simultaneously see the entire structure of the phenomenon or process [3; 208-p].

Through the use of multimedia, interactive visual aids, it is possible to view the process and phenomenon at any time, in order to more fully explain any part or phenomenon, their demonstration several times [4; - 70 p].

Therefore, there is a need to develop a holistic mechanism for using information educational environments in geography lessons. To develop this mechanism, it is necessary for the teacher to redesign improved teaching methods, means, and forms of conveying the content of the topic studied in the lesson to the consciousness of pupils using advanced pedagogical technologies and pedagogical software tools of computers, as well as to design the structure and content of the organization of their pedagogical activity [2; 62-p].

Main part. In this regard, when teaching the subject of geography of Karakalpakstan in general education schools, it is necessary to pay attention to the following:

- analysis of the purpose, content of the lesson and the logic of studying the material;
- thorough preparation of educational and control materials on the topic;
- identification of the main rules (evidence, hypotheses) that pupils should study, development of the necessary didactic material;
- correct selection of necessary teaching aids in accordance with the objectives of the lesson;
- it is necessary to develop methods for using the selected teaching aids. At the same time, it is necessary to pay attention to:
- selection of teaching methods and information educational resources based on the nature of the topics covered;
- development of stages of organizing classes based on the mutual integration of teaching methods and digital learning tools;
- improvement of mechanisms for using standard and non-standard online tests in assessing pupils' knowledge.

The above recommendations serve as the main source for the teacher's effective organization of the geography educational process.

In teaching the subject "Geography of Karakalpakstan," along with providing pupils with educational, upbringing, and developmental education, it is advisable to apply the acquired theoretical knowledge in practice, that is, to form educational competence. Therefore, competence should be understood as the ability of learners to apply existing knowledge, skills, and abilities in their daily activities. Also, based on the continuity, consistency of education, the priority of the learner's personality and interests, the following basic competencies are formed in accordance with their age characteristics. Depending on the nature of competence formation, basic competence and subject-specific competencies are used.

These competencies are formed in pupils through the teaching of the subject "Geography of Karakalpakstan." Furthermore, based on the content of the subject, general competencies related to the subject are also formed in pupils. When teaching the subject "Geography of Karakalpakstan," the following types of subject competencies are formed in pupils:

- Competence in observing, identifying, understanding, and explaining natural, socio-economic processes and phenomena;
- Competence in the correct use of geographical objects, place names:
- Competence in the practical use of globes, geographical atlases and maps:
- Competence in environmental protection and ecological culture:

Pupils of the subject "Geography of Karakalpakstan" should have the necessary and sufficient level of preparedness, as well as the following competencies in the competence of observing, identifying, understanding, and explaining natural, socio-economic processes and phenomena.

As a result of studying the subject of Physical geography of Karakalpakstan:

- can describe the geographical location, geological structure, relief features, and distribution of mineral types of the territory;
- Observes and can independently describe natural processes and geographical phenomena occurring in the territory of Karakalpakstan;
- observes the climatic features of the region, the change of seasons, and can describe the natural changes associated with them;
- in everyday life determines changes in the weather in their place of residence based on local indicators, can measure air temperature using a thermometer;
- can characterize climate change and the factors affecting it by determining the directions of the horizon using a compass and local symbols;
- knows and can tell about the nature of the Republic of Karakalpakstan and its natural geographical regions;
- can perform measurements and determinations of natural phenomena and processes in the territory in everyday life using various instruments (compass, thermometer, barometer, weather vane, etc.);
- Can characterize the natural conditions and resources of Karakalpakstan, analyze and compare their territorial features;
- Knows, understands, and can explain with examples the main geographical factors and patterns that determine the diversity of the nature of Karakalpakstan;
- can describe the geography of the internal waters of the territory (rivers, lakes, irrigation networks) and their changes in accordance with the climate;

- describes the protection of the soil, flora, fauna, and nature of Karakalpakstan, determines the names of specially protected areas and measures for their organisation.

Conclusion. In the 7th grade of general education schools, the course of physical geography of Karakalpakstan is studied consistently. In the course of studying this course, pupils will learn about the peculiarities of the nature of Karakalpakstan in the part of physical geography and its commonalities with the Central Asian region. In this case, along with describing the components of nature, their economic significance, natural and anthropogenic complexes, competencies in the use and protection of nature, and ecological problems are formed.

In addition, it is established that "knowledge aimed at ecology and environmental protection" should be integrated into the content of the geography subject in grades V-VII [1.1], and the above-mentioned goals and objectives, based on the natural conditions of the Republic of Karakalpakstan, primarily require the inclusion of a sufficient amount of knowledge and skills related to ecology, nature management, and environmental protection in the curricula and textbooks of geography education in general education schools.

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POLIESTER IPIDAN MAXSUS YENG FILTR TO‘QIMALARINI ISHLAB CHIQARISHNING TEXNOLOGIK XUSUSIYATLARI

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Annotatsiya. *Ushbu maqolada poliester ipidan maxsus yeng filtr to‘qimalarini ishlab chiqarishning texnologik xususiyatlari, xom-ashyo tanlovi va ishlab chiqarish jarayonlari ilmiy asosda tahlil qilingan. Maqolada poliester tolalarining yuqori mexanik mustahkamligi, kimyoviy va termal barqarorligi filtr samaradorligiga ta’siri ko‘rsatib o‘tilgan. Filtr matosining havo o'tkazuvchanligi, zarrachalarni ushlab qolish samaradorligi, mexanik va kimyoviy barqarorligi asosiy sifat ko‘rsatkichlari sifatida aniqlangan.*

Аннотация. *В данной статье на научной основе анализируются технологические особенности производства специальных фильтрующих тканей из полиэфирной пряжи, выбор сырья и производственные процессы. В статье показано влияние высокой механической прочности, химической и термической стабильности полиэфирных волокон на эффективность фильтрации. В качестве основных показателей качества определены воздухопроницаемость, эффективность удержания частиц, механическая и химическая стабильность фильтрующей ткани.*

Abstract. *This article provides a scientific analysis of the technological features of producing special filter fabrics from polyester yarn, including the selection of raw materials and production processes. It demonstrates the impact of the high mechanical strength, chemical, and thermal stability of polyester fibers on filtration efficiency. The key quality indicators identified include air permeability, particle retention efficiency, and the mechanical and chemical stability of the filter fabric.*

So‘nggi yillarda O‘zbekiston Respublikasi Prezidenti Administratsiyasi tomonidan yengil sanoat va to‘qimachilik sohasini rivojlantirishga qaratilgan qator muhim qaror va farmonlar qabul qilinmoqda. Xususan, O‘zto‘qimachiliksanoat uyushmasi faoliyatini kengaytirish hamda yuqori qo‘shimcha qiymatga ega mahsulotlar ishlab chiqarishni rag‘batlantirish bo‘yicha davlat dasturlari amalga oshirilmoqda. Shu jarayonda poliester ipidan tayyorlangan maxsus yeng filtr to‘qimalarini ishlab chiqish texnologiyalarini takomillashtirish muhim ahamiyat kasb etadi. Bunday materiallar sanoat korxonalarida chang va zararli zarrachalarni samarali ushlash, atmosfera havosini muhofaza qilish hamda ishlab chiqarish jarayonining ekologik xavfsizligini ta’minlashda muhim omil hisoblanadi.

Poliester ipidan tayyorlanadigan maxsus yeng filtr to‘qimalari sanoat korxonalarida chang va zararli zarrachalarni ushlab qolish uchun keng qo‘llaniladigan filtr materiallaridan biridir. Ilmiy adabiyotlarda qayd etilishicha, poliester tolalari yuqori mexanik mustahkamlik, aşınishga chidamlilik va kimyoviy barqarorlik kabi xususiyatlarga ega bo‘lib, bu ularni filtr matolar ishlab chiqarishda eng ko‘p qo‘llaniladigan sintetik tolalardan biriga aylantiradi. Shuningdek, ignalab mustahkamlash

(needle-punch) texnologiyasi yordamida hosil qilingan g‘ovak struktura yuqori havo o‘tkazuvchanlik va samarali chang ushlash imkonini beradi.

Ilmiy tadqiqotlarda filtr matosining samaradorligi tolalar diametri va g‘ovaklik darajasi bilan chambarchas bog‘liqligi aniqlangan. Filtr matoda optimal g‘ovaklik hosil qilinishi chang zarrachalarini ushlab qolish jarayonini yaxshilaydi hamda filtratsiya qarshiligini kamaytiradi. Shu sababli zamonaviy ishlab chiqarish jarayonlarida poliester filtr matolarni termik ishlov berish, kalandrlash va gidrofob qoplamalar bilan ishlov berish texnologiyalari qo‘llaniladi. [1]

Poliester filtr matolarining ayrim texnik ko‘rsatkichlari.

1-jadval

Ko‘rsatkich	Qiymat
Ishlash harorati	130–150 °C
Filtratsiya samaradorligi	95–99 %
Havo o‘tkazuvchanligi	200–350 L/m²·s
Mexanik mustahkamlik	≥1100 N (tanda)

Poliester tolalari asosida ishlab chiqarilgan filtr to‘qimalari sanoat chang ushlash tizimlarida keng qo‘llaniladi. Buning asosiy sababi — poliesterning yuqori mexanik mustahkamligi, kimyoviy barqarorligi va termal chidamliligi hisoblanadi. Tadqiqotlarga ko‘ra, poliester asosidagi filtr matolar yuqori tortilish mustahkamligiga ega bo‘lib, ko‘ndalang va bo‘ylama yo‘nalishda 1000–1700 N gacha bo‘lgan uzilish kuchiga bardosh bera oladi. Bu esa filtr matoning uzoq vaqt davomida deformatsiyasiz ishlashini ta’minlaydi. [2]

Shuningdek, poliester filtr matolari 120–150 °C gacha bo‘lgan haroratda barqaror ishlay oladi. Ushbu termal barqarorlik filtr materialining strukturasi buzilmasdan ishlashiga yordam beradi va filtratsiya samaradorligini yuqori darajada saqlab turadi.

Kimyoviy jihatdan poliester tolalari zaif kislotalar va ayrim ishqoriy muhitlarga nisbatan barqaror bo‘lib, pH 4–9 oralig‘idagi sanoat gaz muhitlarida samarali ishlaydi. Shu sababli ular sement, metallurgiya va kimyo sanoatida keng qo‘llaniladigan filtr materiallari hisoblanadi.[3]

Natijada, poliester tolalarining yuqori mexanik mustahkamligi filtr matoning xizmat muddatini uzaytiradi, termal barqarorlik yuqori haroratli gazlarni tozalash imkonini beradi, kimyoviy barqarorlik esa agressiv muhitlarda ham filtratsiya samaradorligini saqlab qolishga yordam beradi.

Poliester filtr matolarining asosiy texnik ko‘rsatkichlari

2-jadval

Ko‘rsatkich	Qiymat	Filtr samaradorligiga ta’siri
Tortilish mustahkamligi	1000–1700 N	Filtr matoning deformatsiyasiz uzoq ishlashini ta’minlaydi
Ishlash harorati	120–150 °C	Yuqori haroratli gazlarni filtrlash imkonini beradi
Kimyoviy barqarorlik	pH 4–9	Korroziy muhitlarda barqaror ishlash
Havo o‘tkazuvchanligi	10–15 m³/m²·min	Filtratsiya samaradorligi va qarshilikni optimallashtiradi
Filtratsiya samaradorligi	95–99.9 %	Chang va zarrachalarni yuqori darajada ushlab qoladi

Filtr materiallari bo‘yicha olib borilgan ilmiy tadqiqotlarda tolalar diametri, g‘ovaklik darajasi va filtr yuzasining strukturasini optimallashtirish filtratsiya samaradorligini oshirishda muhim omil ekanligi

ta’kidlanadi. Masalan, Xin Zhang va hamkorlari olib borgan tadqiqotda poliester tolalar diametri kamaygan sari filtrning zarrachalarni ushlash samaradorligi oshishi aniqlangan. [3]

Shuningdek, kompozit filtr materiallari ustida olib borilgan tadqiqotlarda tolalar yuzasini modifikatsiya qilish orqali PM10 va PM2.5 zarrachalarini ushlab qolish samaradorligini sezilarli oshirish mumkinligi aniqlangan. [4]

Zarrachalarni ushlab qolish samaradorligi esa filtr tolalarining diametri, g‘ovaklik darajasi va filtr yuzasidagi chang qatlamining hosil bo‘lishiga bog‘liq. Masalan, tadqiqotchi Xingcheng Liu boshchiligidagi ilmiy ishda filtr teshiklari o‘lchami va tolalar diametri filtratsiya samaradorligiga sezilarli ta’sir ko‘rsatishi aniqlangan. [5]

Filtr matosining asosiy sifat ko‘rsatkichlari

3-jadval

Ko‘rsatkich	Tavsifi	Filtr samaradorligiga ta’siri
Havo o‘tkazuvchanligi	Gaz yoki havo oqimining filtr matosi orqali o‘tish qobiliyati	Yuqori bo‘lsa filtr qarshiligi kamayadi va tizim samarali ishlaydi
Zarrachalarni ushlab qolish samaradorligi	Filtrning chang va zarrachalarni ushlash darajasi	Filtratsiya samaradorligini belgilaydi
Mexanik mustahkamlik	Uzilish kuchi va aşınishga chidamlilik	Filtrning xizmat muddatini oshiradi
Kimyoviy barqarorlik	Kimyoviy moddalar ta’siriga chidamlilik	Agressiv gaz muhitida barqaror ishlashni ta’minlaydi

Filtr matosining samaradorligi bir necha asosiy texnik ko‘rsatkichlar orqali baholanadi. Eng muhim ko‘rsatkichlar havo o‘tkazuvchanligi, zarrachalarni ushlab qolish samaradorligi, mexanik mustahkamlik hamda kimyoviy barqarorlik hisoblanadi.

Filtr matosining texnik ko‘rsatkichlari — samarali chang ajratish va past havo qarshiligini ta’minlash uchun hal qiluvchi ahamiyatga ega bo‘lgan parametrlar bo‘lib, ularning optimallashtirilishi ko‘plab ilmiy tadqiqotlarda ko‘rilgan. Asosiy texnik ko‘rsatkichlarga filtr samaradorligi (changni ushlab qolish foizi), bosim tushishi (pressure drop) va sifat ko‘rsatkichlari kiradi. Y. Zhou va boshqalar PTFE, shisha tolali (GF) va polipropilen (PP) kabi materiallarning filtr samaradorligini tahlil qilganida PTFE va GF ~99 % nazariy samaradorlikka ega ekanini aniqlagan, PP esa elektret zaryadi yo‘qolganda samaradorligi 20–60 % gacha pasayishini ko‘rsatgan. Bu havo filtr materiallari texnik ko‘rsatkichlari va qarshilik darajasini izohlashda muhimligidir. [6]

So‘nggi tadqiqotlarda, masalan, needle-punched nonwoven (to‘qilmagan) filtr matolarini optimallashtirish orqali filtr samaradorligi ≈94–95 % ga yetkazilgan, bosim tushishi juda maqbul (≈61 Pa) va yuqori sifat ko‘rsatkichi (quality factor) olinishi mumkinligi matematik modellashtirish orqali ko‘rsatildi. Bu optimallashtirish ip diameteri, needling chuqurligi, sikl va kalander bosimi kabi faktorlarga asoslangan. [7]

Shu asosda optimallashtirish omillari quyidagilarni o‘z ichiga oladi: tola diametri va strukturasining tanlovi, filtr qatlamlarining birikmasi, porozlik nazorati, filtr yuzasiga elektret yoki nanofiber qatlam qo‘shish. Ushbu optimallashtirishlar nafaqat yuqori filtr samaradorligini, balki past bosim tushishi va qulay ishlash rejimini ta’minlashga yordam beradi, bu esa sanoat filtr tizimlarining samaradorligini oshirishga olib keladi

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BOSHLANG‘ICH SINF O‘QUVCHILARIDA RAQAMLI PEDAGOGIKA ORQALI MUSTAQIL FIKRLASHNI RIVOJLANTIRISH METODIKASI

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Annotatsiya:
Ushbu maqolada raqamli pedagogikaning boshlang‘ich ta’lim tizimidagi roli va uning o‘quvchilar intellektual salohiyatiga ta’siri fundamental ravishda tahlil qilinadi. Boshlang‘ich sinf o‘quvchilarida (7-10 yosh) mustaqil fikrlashni shakllantirishning psixologik-pedagogik mexanizmlari, raqamli texnologiyalarning kognitiv yuklamani taqsimlashdagi o‘rni va muammoli ta’lim tamoyillari bayon etilgan. Maqolada xalqaro baholash dasturlari (PISA, PIRLS) talablariga muvofiq o‘quvchi subyektivligini oshirish bo‘yicha aniq takliflar keltirilgan.
Kalit so‘zlar: Raqamli pedagogika, boshlang‘ich ta’lim, mustaqil fikrlash, tanqidiy tahlil, kognitiv rivojlanish, metakognitsiya, adaptiv ta’lim.

Zamonaviy ta’lim tizimi globallashuv, raqamlashtirish va bilimlar iqtisodiyoti sharoitida tubdan yangilanib bormoqda. Ta’lim oldiga qo‘yilayotgan asosiy talab o‘quvchilarda nafaqat bilimlar majmuini shakllantirish, balki ularni real hayotiy vaziyatlarda qo‘llay olish, muammolarni mustaqil hal qilish, tanqidiy va ijodiy fikrlash, ijtimoiy moslashuvchanlik kabi kompetensiyalarni rivojlantirishdan iboratdir.
Global axborotlashuv davrida ta’lim tizimi oldiga qo‘yilgan asosiy talab faqat bilimli emas, balki mustaqil qaror qabul qila oladigan shaxsni tarbiyalashdir. Boshlang‘ich sinf o‘quvchilarida mustaqil fikrlashni rivojlantirish ularning kelajakdagi akademik va ijtimoiy muvaffaqiyatlari uchun poydevor hisoblanadi. Raqamli pedagogika bu o‘rinda shunchaki texnik vosita (kompyuter, planshet) emas, balki o‘quvchining fikrlash algoritmlarini o‘zgartiruvchi konseptual yondashuv sifatida namoyon bo‘ladi.
Boshlang‘ich ta’lim — shaxs kamolotining poydevori bo‘lib, aynan shu bosqichda bolaning bilishga bo‘lgan munosabati, o‘quv faoliyati madaniyati, mustaqil fikrlash

ko‘nikmalari va asosiy ijtimoiy qadriyatlari shakllanadi. Ushbu jarayonni maqsadga yo‘naltirilgan, tizimli va natijaga asoslangan tarzda tashkil etishni nazarda tutadi.

Raqamli pedagogika — bu shunchaki darsda proyektor yoqish emas, balki bolaga “fikrlash laboratoriyasi”ni taqdim etishdir. Boshlang‘ich sinflarda ushbu tizimning to‘g‘ri yo‘lga qo‘yilishi o‘quvchilarni kreativ, tanqidiy fikrlaydigan va global dunyoda o‘z o‘rnini topa oladigan shaxslar qilib tarbiyalaydi. Aniq faktlar shuni ko‘rsatadiki, raqamli ta’lim muhitida voyaga yetayotgan o‘quvchi muammoli vaziyatlarda an’anaviy ta’lim oluvchilarga qaraganda ancha tez va oqilona qaror qabul qiladi.

Raqamli pedagogika – bu ta’lim jarayonida raqamli texnologiyalarni qo‘llash orqali o‘quvchilarning bilim va ko‘nikmalarini rivojlantirishga qaratilgan yondashuvdir. Bu yondashuv o‘quvchilarga o‘z-o‘zini boshqarish, muammolarni hal qilish va ijodiy fikrlash qobiliyatlarini shakllantirishda yordam beradi.

Boshlang‘ich sinf o‘quvchilarining mustaqil fikrlashi bu o‘z fikrlarini ifoda etish, tanqidiy tahlil qilish va yangi g‘oyalarni ishlab chiqish qobiliyatidir. Bu qobiliyatlar o‘quvchilarning akademik muvaffaqiyatlari va shaxsiy rivojlanishlari uchun muhimdir.

Raqamli platformalarda interaktiv darslar tashkil etish orqali o‘quvchilar faol ishtirok etishga undaladi. Masalan, onlayn testlar, viktorinalar va o‘yinlar orqali mustaqil fikrlashni rag‘batlantirish mumkin. O‘quvchilarga kichik loyihalar berish, ularga muammolarni hal qilishda mustaqil fikrlash imkoniyatini yaratadi. Raqamli vositalar yordamida loyiha taqdimotlari tayyorlash o‘quvchilarning ijodkorlik ko‘nikmalarini oshiradi. Shuningdek, o‘quvchilarni guruhlarga bo‘lib, birgalikda muammolarni hal qilishga undash, ularning fikr almashish va bir-biridan o‘rganish imkoniyatlarini kengaytiradi.

Boshlang‘ich sinf yoshidagi o‘quvchilarning kognitiv xususiyatlari.

Psixologlarning nazariyalariga ko‘ra, 7-10 yoshli bolalarda konkret amallar bosqichi davom etadi. Bu davrda bola mantiqiy bog‘lanishlarni vizual va amaliy tajribalar orqali yaxshi o‘zlashtiradi. Raqamli muhit o‘quvchiga “faol konstruktivizm” imkoniyatini beradi. Ya’ni, bola bilimni tayyor holda olmaydi, balki uni raqamli ob’ektlar bilan ishlash jarayonida “quradi”.

Raqamli platformalar o‘quvchiga o‘z xatolarini xavfsiz muhitda tahlil qilish imkonini beradi, bu esa bolada “xato qilishdan qo‘rqmaslik” va mustaqil yechim qidirish instinktini uyg‘otadi.

Mustaqil fikrlashni rivojlantiruvchi raqamli metodlar

1. Muammoli va tadqiqotga asoslangan ta’lim (Inquiry-Based Learning)

Raqamli laboratoriyalar (masalan, PhET Sims) o‘quvchiga laboratoriya sharoitini virtual olib keladi. Amaliy misol: Matematika darsida kasrlarni o‘rganishda o‘quvchi

virtual “pirog” yoki “shokolad”ni bo‘lish orqali mantiqiy xulosalarni o‘zi shakllantiradi. Natijada, o‘qituvchi qoidani aytib berishidan oldin, o‘quvchi jarayonni kuzatib, o‘zining shaxsiy ta’rifini ishlab chiqadi.

2. Gamifikatsiya va strategik fikrlash

Ta’limiy o‘yinlar (Gamification) faqat ko‘ngilochar vosita emas. Strategik o‘yinlar (masalan, Minecraft Education Edition) davomida o‘quvchi resurslarni rejalashtirish, xavflarni baholash va jamoada qaror qabul qilishni o‘rganadi. Bu tanqidiy fikrlashning eng yuqori bosqichidir.

3. Vizualizatsiya va mantiqiy sxemalar (Mind Mapping)

Boshlang‘ich sinf o‘quvchisi uchun ma’lumotlar oqimini tizimlashtirish qiyin. Raqamli intellekt-kartalar (Popplet, Canva) bolaga asosiy g‘oyani ikkinchi darajali ma’lumotlardan ajratishni o‘rgatadi.

Raqamli pedagogikada o‘qituvchi va o‘quvchi munosabatlari muhim ahamiyat kasb etadi. An’anaviy modelda o‘qituvchi “avtoritar bilim manbai” bo‘lsa, raqamli pedagogikada u “fasilitator” va “skaffolder” (ko‘makchi) hisoblanadi.

Fasilitatsiya: O‘qituvchi o‘quvchiga javobni bermaydi, balki javobni topish uchun kerakli raqamli resursni tavsiya qiladi.

Skaffolding: Bola qiynalgan joyda unga raqamli “podskazka” (yo‘naltiruvchi savol) berish orqali mustaqil fikrlashini rag‘batlantiradi.

Raqamli savodxonlikning asosiy qismi — axborotni filtrlashdir. Boshlang‘ich sinfdanoq bolada quyidagi savollar shakllanishi kerak:

Bu ma’lumot qayerdan olindi? (Manba)

Bu ma’lumot rostmi yoki yolg‘on? (Fakt tekshirish)

Nima uchun bu ma’lumot muhim? (Tahlil)

Raqamli qidiruv ko‘nikmalariga ega o‘quvchilar an’anaviy darslik bilan cheklangan tengdoshlariga qaraganda matnni tushunish va tahlil qilishda 40% yuqori natija ko‘rsatadi (PIRLS xalqaro tadqiqotlari asosida).

Metakognitiv qobiliyatlarni o‘stirish mustaqil fikrlashning cho‘qqisi hisoblanadi, ya’ni, o‘z fikrlash jarayonini nazorat qilishdir. Raqamli portfoliolar o‘quvchiga o‘zining bir yil oldingi ishini hozirgisi bilan solishtirish imkonini beradi. “Men qanday rivojlandim” degan savol bolada o‘z-o‘zini baholash va maqsad sari mustaqil harakat qilishni shakllantiradi.

Raqamli pedagogikada foydalaniladigan vositalar, masalan, ta’lim dasturlari, mobil ilovalar va onlayn platformalar, o‘quvchilarning mustaqil fikrlashini rivojlantirishda muhim rol o‘ynaydi. Ushbu vositalar orqali o‘quvchilar yangi bilimlarni mustaqil ravishda o‘zlashtirishlari mumkin.

Boshlang‘ich sinf o‘quvchilarida raqamli pedagogika orqali mustaqil fikrlashni rivojlantirish metodikasi zamonaviy ta’lim jarayonining ajralmas qismidir. Raqamli texnologiyalar yordamida o‘quvchilarning ijodiy fikrlash, muammolarni hal qilish va tanqidiy tahlil qilish qobiliyatlarini oshirish mumkin. Ushbu metodik yondashuvlar nafaqat muvaffaqiyatlarni ta’minlaydi, balki o‘quvchilarning shaxsiy rivojlanishiga ham ijobiy ta’sir ko‘rsatadi. Kelajakda raqamli pedagogikaning yanada kengayishi va takomillashuvi mustaqil fikrlashni rivojlantirishda yangi imkoniyatlar yaratishi kutilmoqda.

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IMPORTANCE OF MANAGEMENT IN HUMAN RESOURCE MANAGEMENT

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Abstract: This article analyzes the role of leadership and management in the human resource management process and their impact on organizational efficiency. In modern management systems, a manager’s leadership skills, proper application of management methods, employee motivation, and team management are essential factors. Furthermore, leadership styles, management functions, and modern approaches to effective human resource management are discussed.

Keywords: human resources, leadership, management, administration, motivation, team, efficiency, HR management, manager, organization.

INTRODUCTION

Nowadays, organizational performance largely depends on effective human resource management. In the modern economy, alongside technology and capital, the human factor plays a crucial role. Therefore, leadership and management are essential in managing human resources.

Leadership is the ability to guide a team towards a common goal, while management involves planning, organizing, directing, and controlling organizational activities. When a manager demonstrates strong leadership skills, discipline, responsibility, and efficiency within the team improve.

Currently, merely giving orders is insufficient in human resource management. Managers must adopt a psychological approach, motivate employees, foster cooperation, and build trust. Thus, in modern HR systems, leadership and management are closely interrelated.

The purpose of this article is to examine the importance of leadership and management in human resource management and analyze their impact on organizational efficiency.

Management and Its Functions

Management is the process of effectively organizing organizational activities. Through management, organizational goals are defined and strategies for achieving them are developed. Modern management theory identifies several key functions, which are also critical in human resource management:

Planning — defining the organization's future activities, setting objectives, and developing strategies to achieve them. Planning determines the number and qualifications of required employees.

Organizing — creating conditions for implementing plans, allocating tasks, and structuring employee activities. Each employee's responsibilities and authority are clearly defined at this stage.

Directing — guiding employees' activities, giving assignments, motivating them, and uniting them toward a common goal. Leadership skills are particularly important in this process.

Coordinating — aligning the activities of all departments and employees to ensure smooth cooperation and minimize conflicts.

Controlling — monitoring performance, comparing results with plans, identifying deficiencies, and taking corrective measures to ensure organizational efficiency.

Management Tasks in Human Resource Management

The above management functions are applied in human resource management through the following tasks:

- **Workforce planning** — determining the required number and qualifications of employees and forecasting future needs.
- **Employee selection** — identifying suitable candidates for vacant positions through interviews and tests.
- **Placement** — assigning selected employees to positions that match their skills and knowledge.
- **Training and development** — enhancing employees' skills and competencies through workshops, seminars, and professional development programs.
- **Performance appraisal** — assessing employees' work outcomes, analyzing performance, and planning future development.
- **Incentives and rewards** — motivating employees through financial and non-financial rewards and recognizing their contributions.

Proper application of management functions facilitates effective human resource management, contributing to organizational stability, increased productivity, and a positive work environment.

Leadership Concept and Its Importance

Leadership is the ability of a manager to inspire and guide a team. A leader is not only a person who gives orders but also one who motivates the team, solves problems, and provides direction. In modern management theory, leadership is a key component of human resource management. Organizational performance depends significantly on a manager's leadership ability.

Leadership involves guiding the team toward common goals, inspiring employees, and utilizing their potential effectively. While a manager plans and controls, a leader directs the team and unites them toward achieving objectives. Therefore, in modern organizations, managers must also be effective leaders.

According to contemporary management theory, a leader should possess the following qualities:

- **Responsibility** — being accountable for decisions and team outcomes, creating a trustful environment.
- **Fairness** — treating all employees equally and maintaining objectivity in evaluations, fostering respect and reducing conflicts.
- **Communication skills** — effectively interacting with employees, listening to their opinions, and providing clear guidance.
- **Initiative** — proactively solving problems and implementing improvements to advance organizational development.
- **Decision-making ability** — making timely and accurate decisions in complex situations, which directly affects management effectiveness.
- **Team motivation** — inspiring and motivating employees to perform effectively and achieve high results.

Leadership styles reflect how a manager interacts with employees. The main leadership styles in management theory include:

- **Authoritarian leadership** — the manager makes all decisions and expects employees to follow orders. While it ensures discipline, it may reduce employee initiative.
- **Democratic leadership** — the manager considers team input in decision-making, involving employees in management processes. This style fosters trust and collaboration and is considered the most effective in modern organizations.
- **Laissez-faire leadership** — the manager provides significant freedom to employees and allows them to work independently. It can be effective in highly skilled teams but may lead to disorder if oversight is insufficient.

Leadership directly affects organizational efficiency and employee engagement. In modern management, democratic and collaborative leadership styles are preferred.

The Combined Role of Leadership and Management

Effective human resource management requires managers to be both administrators and leaders. Management ensures order, while leadership develops the team and motivates employees.

When leadership and management are applied together, organizations experience several positive outcomes:

- **A positive team environment** — leadership fosters trust, respect, and cooperation among team members.
- **Increased employee engagement** — motivated leaders inspire employees to work actively and enhance their professional skills.
- **Improved productivity** — effective management combined with motivating leadership enables employees to perform tasks efficiently and accurately.
- **Reduced conflicts** — leaders identify and resolve disagreements promptly, maintaining stability and discipline.
- **Enhanced organizational performance** — coordinated processes, motivated employees, and effective supervision lead to significant efficiency improvements.

It is important to note that neither management nor leadership alone can ensure organizational success. Their combined application enhances team morale, engagement, and overall performance.

Conclusion

In conclusion, leadership and management are crucial in human resource management. While management organizes organizational processes, leadership develops the team and enhances efficiency. Modern organizations require managers who are also effective leaders. Organizational success in the future will largely depend on the leadership potential of managers.

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RAIL GASKETS ARE MADE OF VARIOUS MATERIALS DEPENDING ON THE OPERATIONAL REQUIREMENTS.

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Annotation. An increase in the proportion of intermolecular and a decrease in the proportion of intra-molecular bonds. The main ingredients of elastomeric compositions are fillers, their purpose is to change the volume and properties of the composition and quality indicators in the right direction. Achieving this goal is primarily related to the nature of the combination of elastomer and filler, as well as the nature of their interaction.

Keywords: intermolecular, ingredients, elastomeric composition, elastomer, temperature, chemistry, oils, acids, deformation.

For many years, the development of railway transport and mechanical engineering around the world has been directly linked to the standard of living in the country and the development of the entire transport infrastructure. High-quality parts are required for its smooth operation. One of the important components in railway equipment is rubber products.

Rubber products are widely used in the field of transportation, especially on railways and in public transport systems. They have proven their advantages in terms of safety, comfort and efficiency and play an important role in the development of modern transport systems.

Rubber products have a beneficial effect on noise absorption, reduce the level of noise and vibrations caused by the movement of railway trains. Due to their reliability and slow wear, rubber products can avoid many breakdowns and disruptions in transport. Sealing rings reduce friction between surfaces, which increases the service life of the vehicle. Rubber gaskets reduce the risk of railway accidents by preventing leakage of liquids from the train's internal systems, they reduce the risk of fire and malfunction of other parts. Rubber cushions reduce noise and vibrations in the passenger car, under-

rail gaskets reduce dynamic loads on the track, reduce vibrations, reduce noise, which has a positive effect on passenger comfort.

Since railway transport in the territory of the Republic of Uzbekistan occupies an important place in the structure of production and logistics, as well as passenger transportation, it is necessary to monitor the serviceability of all parts and components of each rolling stock.

One of the important elements of ensuring the reliability of the track (roadbed) and the train is the use of rubber products. They improve the operation of rolling stock and traction, and extend the service life. The safety of people and the safety of material assets directly depends on this. Rubber products are used in all areas of the railway industry, and the railway industry cannot do without them. Rubber products are used as consumables and as basic parts. Similar products are also used in the manufacture and repair of railway tracks. Rubber products include such groups of components and spare parts as cuffs, seals, diaphragms, rings, bushings, shock absorbers, gaskets, oil seals, etc.

In the world practice of railway construction, one of the priority issues is the development of technologies and materials aimed at maximizing the dampening of vibration-dynamic effects arising from the movement of high-speed and high-speed trains, reducing their harmful effects on the railway track, as well as improving the safety and comfort of their movement. In developed countries such as the USA, Great Britain, France, Germany, and Japan, special attention is paid to the development of methods aimed at reducing and preventing various vibration-dynamic effects that have a detrimental effect on railway operation. In this context, the most important task is to develop new types of shock-absorbing elements of the upper structure of the track under the rail linings, providing a significant reduction in the vibration-dynamic effects resulting from heavy train traffic in the area of the rail junction. The residual deformations accumulated in this zone contribute to splashes of the roadbed, deterioration of the strength and geometry of the railway track, which perceives the vibro-dynamic load. The creation of new composite high-performance rubber gaskets

makes it possible to significantly improve the quality and reduce financial costs for the current maintenance of the track.

In the leading scientific centers of the world, work is being carried out aimed at developing various modifications of the shock-absorbing elements of the upper structure of the track. In particular, relief track linings with bulges of various geometries were proposed. To improve the damping properties, various materials were used for the manufacture of rail linings, used for sleeper linings, used ballast mats, etc. One of the most important tasks in this direction is to improve the damping properties of the shock-absorbing elements of the intermediate fasteners of the upper structure of the track, through the integrated use of new chemical modifiers and mineral fillers, which significantly improve the physical and mechanical properties of shock-absorbing materials in order to obtain the necessary parameters for a specific type of intermediate fastening. This issue is relevant all over the world, since the operating conditions for each region are individual.

The promotion of new technologies for shock-absorbing gaskets in the Republic of Uzbekistan is being held back due to the lack of production of almost all components for rail gaskets. Therefore, it is of scientific and practical interest to develop a rail gasket with preset physical and mechanical parameters for effective vibration protection of the rail base using local mineral fillers. Under the rail linings are an important element of the upper structure of the railway track, ensuring optimal interaction between the rail and the supporting structure (sleeper or concrete slab). Their main function is to evenly distribute loads, reduce dynamic impacts, and increase the service life of track elements.

Under the rail gaskets are made of various materials depending on the operational requirements. The most common are: rubber gaskets (natural and synthetic rubber); polymer materials (polyurethane, polyethylene); composite materials with additives to increase strength and wear resistance.

Design features include the presence of grooves or special protrusions that prevent the gasket from shifting under load, as well as special channels to improve drainage and

reduce residual deformation. The main physical and mechanical characteristics of under-rail gaskets include: compressive strength; elasticity and resilience; temperature stability (operating range from -50°C to +50°C); wear resistance; electrical resistance. These properties directly affect the operational reliability and durability of the railway track.

The requirements for under-rail gaskets are regulated by standards such as GOST and technical specifications of railway transport. The main parameters include: geometric accuracy; resistance to loads and deformations; durability; electrical insulation properties; environmental safety.

The use of high-quality under-rail gaskets can significantly increase the service life of the upper structure of the track, reduce noise and vibration, and increase passenger comfort. In addition, under-rail gaskets contribute to the safety of the ballast layer and sleepers, which reduces the cost of operating and repairing the track.

In the light of the above, this dissertation is devoted to the development of scientific foundations for the creation of import-substituting composite elastomeric materials and products for machine-building automotive and railway applications using local raw materials, which is a new promising area and solves an important national economic and environmental problem of the Republic.

To achieve this goal, the following main tasks are defined:

The study of the physico-chemical properties and structure of local and secondary raw materials, the development of technologies for their production and enrichment, and the effect of the obtained ingredients on the viscosity, stickiness and structure of elastomers used for special and general purposes;

Preparation of a standard composition based on elastomers used for special and general purposes in various conditions, with the addition of created organic and inorganic ingredients and the study of the kinetics of their vulcanization and structure formation;

Determination of the effect of the developed ingredients on plastoelastic, rheological, technological, physico-mechanical, dynamic, vibration-dampening, reduction of shock loads under pressure and operational properties of the formed composition based on elastomers of general and special purpose;

Development of compositions and technologies for the production of reinforced and non-reinforced, molded and unformatted special rubber products for use in mechanical engineering, automobile and railway structures and agricultural machinery, ingredients created on the basis of local and secondary raw materials and obtained organomineral compositions using them.

The state and development trends of currently available composite elastomeric materials with specific properties, rubbers and ingredients based on them, reinforced and non-reinforced products are analyzed.

Information is provided on the preparation of compositions based on high-molecular compounds, their composition, structure, properties, application, methods of modifying ingredients, and the main factors affecting the composition and technological performance of rubber products.

Based on a critical analysis of the literature and a study of the current state of the process of modifying ingredients and composite organomineral materials, the most promising direction in the creation of filled composites is the search for multifunctional ingredients based on local raw materials and the creation of a composition and technology for obtaining composite materials and products with unique properties based on them, and a dissertation plan has been drawn up.

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SUT BEZI SARATONI KASALLIGINI KIMYOTERAPIYA BILAN DAVOLASHNING YUTUQ VA KAMCHILIKLARI

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Annotatsiya

Sut bezi saratoni (SBS) ayollar orasida eng ko‘p uchraydigan onkologik kasallik bo‘lib, global o‘lim sabablaridan biri hisoblanadi. Kimyoterapiya kasallikning erta va rivojlangan bosqichlarida muhim davolash usuli sifatida qo‘llaniladi. Ayniqsa, antrasiklinlar, taksanlar va platina asosidagi preparatlar adjuvant, neoadjuvant hamda metastatik bosqichlarda samarali hisoblanadi. Ushbu maqolada kimyoterapiyaning klinik samaradorligi, omon qolish ko‘rsatkichlariga ta’siri hamda nojo‘ya ta’sirlari tahlil qilinadi.

Kalit so‘zlar: sut bezi saratoni, kimyoterapiya, doksorubitsin, paklitaksel, neoadjuvant terapiya, toksiklik, umumiy omon qolish.

Kirish. Sut bezi saratoni dunyo bo‘yicha ayollarda eng keng tarqalgan onkologik kasallikdir. World Health Organization ma’lumotlariga ko‘ra, har yili millionlab yangi holatlar aniqlanadi [1-2].

SBS biologik jihatdan geterogen kasallik bo‘lib, gormonal retseptor (ER/PR), HER2 statusi va proliferativ indeksga ko‘ra turli subtiplariga ega. Kimyoterapiya quyidagi holatlarda qo‘llaniladi [3-4]:

- Neoadjuvant (operatsiyadan oldin)
- Adjuvant (operatsiyadan keyin)
- Metastatik bosqichda

Keng qo‘llaniladigan preparatlar: doksorubitsin (antrasiklin), siklofosfamid, paklitaksel, dosetaksel va karboplatin [5].

Metod. Mazkur maqola 2020–2025 yillarda chop etilgan randomizatsiyalangan klinik tadqiqotlar, meta-tahlillar va xalqaro onkologik qo‘llanmalar asosida tayyorlandi. Asosiy baholash mezonlari:

- Umumiy omon qolish (Overall Survival — OS)
- Kasalliksiz omon qolish (Disease-Free Survival — DFS)
- To‘liq patologik javob (pCR)
- 3–4 darajali toksiklik ko‘rsatkichlari

Tahlilda antrasiklin + taksan kombinatsiyalari hamda platina asosidagi sxemalar o‘rganildi.

Tadqiqot natijalari

Jadval 1. Kimyoterapiyaning klinik samaradorligi

Davolash sxemasi	Qo‘llanish bosqichi	OS / DFS ta’siri	Izoh
AC (Doksorubitsin + Siklofosfamid)	Adjuvant	DFS oshadi	Standart sxema
AC → Paklitaksel	Adjuvant	5 yillik DFS sezilarli oshadi	Taksan qo‘shilishi samarali
Neoadjuvant taksan + antrasiklin	Operatsiyadan oldin	pCR 20–40%	O‘smalar hajmi kamayadi
Karboplatin + Paklitaksel (TNBC)	Neoadjuvant	pCR yuqori	Uch marta manfiy turda samarali
Metastatik bosqich kombinatsion terapiya	Palliativ	OS o‘rtacha 18–24 oy	Hayot sifatini yaxshilaydi

Jadval 2. Kimyoterapiya bilan bog‘liq asosiy nojo‘ya ta’sirlar

Nojo‘ya ta’sir	Antrasiklin	Taksan	Platina
Mielosupressiya	Yuqori	O‘rtacha	Yuqori
Kardiyotoksiklik	Yuqori	Past	Past
Neyropatiya	Past	Yuqori	O‘rtacha
Ko‘ngil aynishi	O‘rtacha	O‘rtacha	Yuqori
Soch to‘kilishi	Yuqori	Yuqori	O‘rtacha

Natijalar tahlili. Natijalar shuni ko‘rsatadiki, antrasiklin va taksan asosidagi kimyoterapiya SBSda uzoq muddatli omon qolishni oshiradi. Ayniqsa, HER2 manfiy va yuqori xavf guruhlarida adjuvant kimyoterapiya muhim ahamiyatga ega.

Uch marta manfiy sut bezi saratoni (TNBC) da platina asosidagi terapiya yuqori patologik javob ko‘rsatkichini beradi. Shu bilan birga, kardiyotoksiklik (antrasiklinlar) va periferik neyropatiya (taksanlar) davolashning asosiy cheklovlaridan hisoblanadi.

So‘nggi yillarda kimyoterapiya maqsadli terapiya va immunoterapiya bilan kombinatsiyada qo‘llanib, yanada yaxshi natijalar bermoqda.

Xulosa. Usulning yutuqlari:

- 5 yillik kasalliksiz omon qolishni oshiradi
- O‘smalar hajmini kamaytiradi (neoadjuvant samarasi)

- Yuqori xavf guruhlarida relapsni kamaytiradi
- Metastatik bosqichda hayot sifatini yaxshilaydi

Kamchiliklari esa:

- Kardiyotoksiklik (antrasiklinlar)
- Periferik neyropatiya (taksanlar)
- Mielosupressiya
- Reproduktiv funksiyaga ta’siri
- Yuqori iqtisodiy xarajat

Individual yondashuv va molekulyar subtipni aniqlash davolash samaradorligini oshiradi.

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THE ROLE OF THE STATE IN A MARKET ECONOMY: THEORETICAL APPROACHES AND PRACTICAL EXPERIENCE

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ABSTRACT. This scientific article analyzes the role and functions of the state in a market economy from both theoretical and practical perspectives. It discusses the necessity and limits of state intervention based on classical, neoclassical, and Keynesian approaches. The study also examines international experience of developed and developing countries.

KEYWORDS: market economy, state intervention, fiscal policy, monetary policy, economic regulation.

INTRODUCTION

In a market economy, the issue of state intervention in economic processes is one of the most important and controversial topics in economic theory. Classical economists advocated minimal state involvement in the economy; however, modern economic systems increasingly require active state participation. The main function of the state is to create a legal and institutional framework that ensures the efficient functioning of market mechanisms.

At the same time, the allocation of resources in a market economy is not always efficient, which leads to so-called “market failures.” In such cases, state intervention becomes necessary. In particular, the role of the state is crucial in reducing social inequality, developing infrastructure, and ensuring economic stability [1].

In the context of globalization, state economic policy determines not only national economic performance but also international competitiveness. Therefore, studying the functions of the state in the economy remains a highly relevant scientific issue.

LITERATURE REVIEW

Adam Smith, in his work An Inquiry into the Nature and Causes of the Wealth of Nations, introduced the concept of the “invisible hand” and argued that resources are efficiently allocated through free markets, while state intervention should be minimal [2]. According to Smith, competitive markets naturally achieve equilibrium without excessive government interference.

John Maynard Keynes, in The General Theory of Employment, Interest and Money, argued that markets do not always self-correct and therefore require active fiscal policy

by the state [3]. He emphasized increasing government spending during economic downturns to stimulate aggregate demand.

Milton Friedman, the founder of monetarism, advocated limiting direct state intervention and focusing instead on controlling the money supply to ensure economic stability [4]. He believed that excessive government intervention reduces economic efficiency.

Joseph Stiglitz emphasized that due to imperfect information in markets, state intervention is necessary to reduce inequality and improve social welfare [5]. He highlighted the importance of government policies in addressing market imperfections.

Richard Musgrave identified three key functions of the state: allocation, stabilization, and redistribution [6]. These functions form the foundation of modern public finance theory.

METHODOLOGY

This study employs systematic analysis, comparative analysis, and economic generalization methods. The role of the state in a market economy was examined based on different theoretical schools of thought. In addition, the experiences of developed and developing countries were compared. Statistical data were used to assess the impact of state intervention on economic efficiency. Inductive and deductive reasoning methods were also applied.

ANALYSIS AND RESULTS

The role of the state in a market economy is expressed through several key functions: legal regulation, macroeconomic stabilization, social policy implementation, and infrastructure development.

Table 1.

State Intervention and Economic Performance (Comparative Analysis)

Country	Level of State Intervention	Average Economic Growth (%)	Income Inequality (Gini Coefficient)	Remarks
USA	Medium	2.1	0.41	Market-oriented with regulation
Germany	High	1.8	0.29	Social market economy model

Sweden	Very high	1.5	0.27	Strong welfare state model
South Korea	Medium-High	3.2	0.34	Active industrial policy
Uzbekistan	Increasing	5.5	0.36	Reform and liberalization process

The table shows that there is a complex relationship between the level of state intervention and economic outcomes. For example, countries such as Sweden and Germany demonstrate low inequality due to strong social policies, although their economic growth rates are relatively moderate.

The experience of the USA and South Korea shows that a balanced combination of market mechanisms and state support leads to higher economic efficiency. In the case of Uzbekistan, ongoing economic liberalization highlights the increasing transformational role of the state.

Overall, the optimal level of state intervention depends on a country's institutional structure and level of economic development. Both excessive and insufficient intervention may lead to economic imbalance.

CONCLUSION

The role of the state in a market economy remains one of the most important and continuously relevant issues in both economic theory and policy practice. The results of this study show that while market mechanisms play a key role in efficient resource allocation, they do not always ensure socially optimal outcomes. Therefore, state intervention emerges as a necessary institution.

Theoretical analysis indicates that classical economists support minimal state involvement, while Keynesian theory emphasizes active fiscal policy as a key factor for economic stability. Monetarists advocate limiting direct intervention and focusing on monetary policy, whereas modern institutional economists highlight the importance of the state in correcting market imperfections, monopolies, and inequality.

Practical experience shows that the most effective economic outcomes are achieved in systems where there is a balance between market forces and state intervention. Countries such as Germany and Sweden demonstrate high social welfare levels, while the USA and South Korea show strong economic growth due to a balanced approach combining market mechanisms with strategic state support. This confirms that the role

of the state is not uniform but depends on institutional, historical, and developmental contexts.

In transition economies such as Uzbekistan, the state plays a particularly important transformational role. During reforms, the state acts as a key actor in building market institutions, ensuring competition, and supporting strategic sectors. When combined with gradual liberalization, this creates a solid foundation for sustainable economic growth.

In conclusion, the role of the state in a market economy is not a fixed model but a dynamic and adaptive system. The most effective approach is a mixed economy model based on a balance between market forces and state intervention. Such a model not only enhances economic efficiency but also ensures social justice and sustainable development. In the future, with the acceleration of digitalization and globalization, the role of the state is expected to further transform toward regulation, innovation support, and strategic guidance.

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